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Just a thought to give thee pleasure,
Just a hope to gild the way,
Just a word to speak of Jesus,
Do you love Him as you may?

THE COLORADO DESERT.

A vast triangular-depressed plain, below the level of the sea for a large portion of its surface, with an approximate area of twelve million acres (about one-half of which lies in Mexican territory), and comparatively destitute of verdure or of animal life, is the great basin known as the Colorado Desert.

This remarkable region lies between the peninsular range of mountains and the Colorado river of the west, extending from the San Gorgonio pass, at the base of the San Bernardino mountains, on the north, to the shores of the Gulf of California, on the south, and forms one of the most extensive and important portions of the arid regions of the United States. On the north and northeast it is separated from the more elevated plains of the Mohave desert by a low range of denuded hills, extending from the San Bernardino mountains to near the junction of the Gila and Colorado rivers. Similar arid conditions exist on the eastern borders of the Colorado river, in Arizona, and south in Sonora, and along the Gulf shores.

From their rich chocolate-brown color, the inhospitable barrier between the Colorado and the Mohave deserts is frequently indicated on maps as the Chocolate mountains; but the range is better known to miners as the Chuckawalla (Lizard) mountains, a peculiarly appropriate name from the great abundance and variety of lizards, but probably given from some fancied resemblance in the outline of these hills to this nimble animal.

The peninsula range of mountains, with a varying altitude of four thousand to eleven thousand feet, rise in precipitous abruptness from the western borders of the plains. The crest of this mountain range forms a sharp and well-defined line of demarkation between the arid region and the rich and fertile western slope. The summit is usually clothed with forests of oak and pine. The western slope is thickly overgrown with a varied vegetation, the valleys supplied in a greater or less degree with timber and water. Not so on the eastern declivity—the precipitous walls of rock, hundreds, often thousands of feet in height, present small inducements for plant growth, and the less precipitous banks are but slightly less devoid of botanical forms.

In the mighty chasms (or canyons), eroded by the still active, tremendous forces of nature, the botanist finds his richest harvest amid scenery that for beauty and grandeur would

rival even the Yosemite. Surrounded by walls three thousand feet or more high, the queenly Washington palm (Washington filifera) may be found in groves, growing with tropical luxuriance beside quiet brooklets, rivalling in beauty and novelty the giant Sequoia groves of California.

Despite the large areas totally barren of vegetable life for the larger portion of the year, the absolute lack of rain through long periods, which may extend over three or more years of time, the Colorado desert possesses in seasons of precipitation a flora that in variety and beauty of forms surpasses that of the Atlantic states. In richness of variety and coloring, the flora of California is probably unsurpassed, and the arid regions of the state are not one whit behind the more attractive western slopes. In springtime the stately lily of the desert (Hesperocallis undulata) wastes its sweetness on the desert air; every dry and thorny bush produces its quota of beauty, and a wealth of brilliant annuals spring into brief existance.

During June and July, 1888, the writer made his initial exploration in the Colorado desert, the main object being the examination of various prospects of gold, silver, lead and copper, which had been discovered in the Chuckawalla mountains, for a gentleman who was largely interested in their development. A brief report on this region, named the Pacific mining district, appeared in the tenth annual report of the California state mineralogist, 1890 ("The Colorado Desert," by Charles Russell Orcutt, pages 899-919).

Lyell says:—"Geology is the science which investigates the successive changes that have taken place in the organic and inorganic kingdoms of nature; it inquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of our planet."

In the decade commencing with 1850 the more depressed part of the Colorado desert seems to have been known as the Cienega Grande, now better known perhaps as the Salton Sea, but more usually designated as the Dry Lake; in 1870 we are told by early emigrants of that period that the Colorado river was in the habit of annually overflowing its banks during the time of summer freshets, when the snows melted in the mountains whence the river has its source. This "annual overflow" (as often omitted as otherwise, it is said) formed a channel through the deep alluvial bottom lands of the great basin, to which the name New River was applied by the earlier pioneers who crossed the desert on the old overland route from Ft. Yuma to San Diego.

Along the course of New River, the Cocopa and other tribes of Indians planted and raised magnificent crops on the overflowed lands. Corn, melons, squashes, and other vegetables, and grain, reached the rankest growth attainable, and some of these early pioneers spoke with wonder of the fertility of the soil and the success attending these Indians in their agricultural labors. These fertile lands were formed of the sediment deposited by the waters of the Colorado river, and as the soil increased in depth the overflow decreased; with the increasing infrequency of these overflows now of more rare occurrence, the Indians were compelled to depart—the Cocopas retreating to the region of the gulf, the Cahuillas to the mountains around the northern arm of the desert. In 1890 the desert Indian huts might yet be found among the mesquite groves of New river, and in 1892 I found the Indians producing from the untilled soil crops of promise, after an overflow of some of the lands below the United States boundary.

"Approaching Carrizo creek, we saw for the first time in many days, strata of unchanged sedimentary rock. These consist of shales and clays of a light brown or pinkish color, forming hills of considerable magnitude at the base of the mountains. From their soft and yielding texture they have been eroded into a great variety of fantastic and imitative forms. This series of beds have been greatly disturbed, in many places exhibiting lines of fracture and displacement. Where they are cut through in the bed of Carrizo creek, they contain concretions and bands of dark brown ferruginous limestone,

which include large numbers of fossils, ostreas and anomias. These have been described by Mr. Conrad, and are considered of Miocene age. In the debris of these shale beds I found fragments of the great oyster (Ostrea titan), characteristic of the Miocene beds of the California coast. A few miles north of this point, similar strata, probably of the same age, were noticed by Dr. Le Conte, but there they contain gnathodon, an estuary shell, showing that the portion of the desert where they are now found was once covered by brackish water."—J. S. Newberry.

Dr. J. G. Cooper reports (in bulletin 4, California state mining bureau, pages 58 and 59) the discovery by H. W. Fairbanks, near Carrizo creek of "fossile coral-islands, the coral forming extensive beds about the summits of short isolated ridges detached from the mountains of the western rim, and consisting at their bases of granitic or metamorphic rocks. The ridges appear to have been islands when the desert formed part of the Gulf of California, or of the Pacific ocean, and were at the right depth beneath the surface for coral growth on their summits for a long period. With the coral occurred several fossil shells of forms quite unlike those of the late tertiary of Carrizo creek beds, and apparently unlike those now inhabiting the Gulf of California."

Fragments of fossiliferous rock of the Carboniferous age have been found in the Carrizo creek region by various collectors, but none in place have yet been reported.

The Indians, according to Dr. Stephen Bowers, still preserve the memory of catching fish along the eastern base of the San Jacinto mountains, where the Cahuilla Indians pointed out to him the artificial pools, or "stone fish traps," where their ancestors easily secured the fish on the receding of the tides of the ancient sea. This would seem to indicate that the change from an arm of the gulf is comparatively recent, and a study of the fossils seems to confirm this view. An old Indian in the Cuyamaca mountains pointed out to miners a few years ago points in the hills to the eastward where his great grandfather used to catch fish from the sea.

The cause of the separation of this region from the gulf can be readily understood in the present encroachment of the land that is forming from the sediment and debris of the Colorado river, where it empties into the gulf. With the formation of a barrier separating thebasin from the gulf, the imprisoned waters were at once subjected to rapid evaporation.

The presence of fresh water shells in a semi-fossil condition, of a brackish water mollusk, and of marine shells of species now found living at San Diego, on the Pacific side, would seem to indicate that the great changes which have unquestionably taken place in this remarkable region were the result of natural phenomena of gradual, yet rapid, occurrence. After its isolation from the sea, with rapid evaporation, few years were requisite to transform this basin from an arm of the sea to a barren waste, the salt of the sea water forming the salt mines at Salton.

The Colorado river doubtless hurried past as it does today to the gulf, until breaking down the barrier it had itself erected. With alternate periods of evaporation and influx of fresh water, the great basin changed first to a brackish lagoon, and finally to a vast fresh water lake.

The water of the Colorado river at Yuma is known to carry at high water not less than ten per centum of solid matter. The deposit of this sediment in the great basin doubtless rapidly formed the deep and fertile lands which are now being harnessed into service at Indio and Imperial, and being converted at the latter place, by the utilizing under control of the water from the Colorado river, into fields of agricultural promise.

Dr. Robert Edward Carter Stearns, in a paper read before the California academy of sciences, entitled "Remarks on fossil shells from the Colorado Desert" (published in the American Naturalist, 13:141-154, March, 1879), discussed the occurrence of fresh water shells found in a well at Walter's station at a depth of fifty feet. The surface of the desert where this well was

sunk is 195.54 feet below sea level. Dr. Stearns remarks:

"Shall we indulge in a guess as to the depth of the water when these shells were alive? Shall we add the depth of the well to the elevation of bench marks, the ancient levels which form terrace lines in some places along the distant hills, once a part of the shores of an ancient lake, the walls of the basin which once inclosed and held a fresh-water sea? It may have been, however, that the lake was never so deep as the figures thus added would indicate, and that instead of a lake or a series of lakes, there existed only a lagoon or chain of lagoons, connected or disconnected, according to the volume of water, which probably varied one season as compared with another; a system of shallow reservoirs, receiving the catchment or surplus water in periods or seasons of unusual rainfall, sometimes, after a prolonged and widespread storm of great severity, uniting and forming an extensive expanse a few feet only in depth, as was seen in the valleys of California during the notable winter of 1861-62. The rate of depression may have been such as to continue to keep the lagoons supplied, * * * and that only within a very recent period has this depressed portion of the Colorado basin become bare and dry. Are the phenomena which this vast and remarkable region exhibits * * * the result of catastrophic action, sudden, violent, and widespread, or the result of gradual changes moving slowly through countless centuries?"

At Salton fresh water shells are found in countless myriads, with recent species of marine shells, on the surface of the plain, 250 feet below sea level. Portions of the Dry lake are 300 feet below sea level. These minute fresh water shells are drifted into windrows in places, where they may be scraped up by the quart.

Along the eastern base of the San Jacinto mountains, an old beach line is well defined, and can be easily traced for miles. The rocks are worn and rounded up to this line, sharp and jagged above. This line by actual measurement has been found to be even with the present leval of the sea.

Major W. H. Emory, in report of the United States and Mexican boundary survey, gave the following table of distances:

San Felipe to Vallecito, 17.85 miles.

Vallecito to Carrizo creek, 16.6 miles.

Carrizo creek to Big laguna, 26.41 miles.

Big laguna to New river, 5.83 miles.

New river to Little laguna, 4.5 miles.

Little laguna to Alamo Mocho, 16.44 miles.

Alamo Mocho to Cook's well, 21.84 miles.

Cook's well to Fort Yuma, 20 miles.

Dr. Charles Christopher Parry, botanist and geologist of the United States boundary commission, in reporting a reconnoissance made in 1849, wrote, concerning this region, as follows:

"On leaving the last rocky exposures to enter on the open desert plain, we pass, some distance down the bed of Carrizo creek; along the course of which are exposed the high bluffs of sand, marl and clay, exhibiting a fine sectional view of the tertiary formation on which the desert plateau is based. At the point where the road leaves the bed of the creek, to mount to the desert tableland, some 150 feet above, fossil marine shells of Ostrea are found, and gypsum makes its appearance in extensive beds. The upper layer of the tableland shows a variable thickness, composed of water-worn pebbles, derived from the adjoining mountains. Near the mountain base, this plateau has a height of about 500 feet above the level of the Colorado river. The surface extends in a gentle slope towards the Colorado, or eastward, about the distance of 25 miles, where it reaches its lowest depression at the lagoon or New river basin, which is in fact a part of the extended alluvial tracts belonging to the Colorado river."

The New river region receives the drainage of a large scope of country, which is sometimes visited by heavy showers. "It retains this rain-water, and river overflows, for several months; when both these sources fail, it becomes a perfectly dry bed, or contracts into quaggy saline marshes" (Parry). After a heavy rain or overflow there is a rank growth of grass, and other vegetation, while considerable portions sustain a heavy growth

of the mesquite. This affords fine grazing for stock, which cattle men have not been slow to appropriate.

Between the peninsula range and the Colorado river and the gulf lies a high mountain range, to the most northern and western point of which has been given the name of Signal mountain; this consists of a form of syenite, associated with recent lava. "Its surface is bare, and presents a forbidding outline of dark weathered rock, variously marked by furrows, and shows an irregular crest, gradually sloping towards the east." (Parry).

The Maricopas (of Arizona), the Cuchanos or Yumas, and the Cocopas are said to have originally formed one tribe. The Cocopa Indians reside within the limits of Mexico and the Yumas in United States territory. Major Heintzelman, in speaking of their agriculture, says: "It is simple; with an old axe, if they are so fortunate as to possess one, knives, and fire, a spot likely to overflow is cleared; after the waters subside, from the annual rise, small holes are dug at proper intervals, a few inches deep, with a sharpened stick, having first removed the surface for an inch or two, as it is apt to cake; the ground is tasted; if salt, rejected and if not the seeds are planted. No further care is required but to remove the weeds, which grow most luxuriantly wherever the water has been. They cultivate watermelons, muskmelons, pumpkins, corn, and beans. The watermelons are small and indifferent, muskmelons large, and pumpkins good; these latter they cut and dry for winter use. Wheat is planted in the same manner, near the lagoons, in December or January, and ripens in May or June. It has a fine, plump grain and well-filled heads. They also grow grass-seed for food; it is prepared by pounding the seed in wooden mortars made of mesquite, or in the ground. With water the meal is kneaded into a mass and then dried in the sun. The mesquite bean is prepared in the same manner, and will keep to the next season. The pod-mesquite begins to ripen the latter part of June; the screw-bean a little later. Both contain a great deal of saccharine matter; the latter is so full, it furnishes, by boiling, a palatable molasses; and from the former, by boiling and fermentation, a tolerably good drink may be made. The preat dependence of the Indian for food, besides the product of his fields, is the mesquite bean. Mules form a favorite article of food; but horses are so highly prized, they seldom kill them, unless pressed by hunger, or required by their customs."

Much the same methods are followed by the Cocopas today, as observed by the writer. They also visit the canyons opening on the desert from the west, and gather the sweet and edible palm fruits, there so abundant, and no doubt seek at times the pinyons or pine nuts in the forests at the summit of the peninsula range.

The townsite of Imperial is situated about 30 miles east of the old stage station on Carrizo creek, and here a new civilization, based on modern agricultural methods, is like to thrive where roamed the nomad in former time.

Dr. J. Le Conte, gave an interesting account of some volcanic mud springs or solfataras, near the Southern Pacific railroad, on the Colorado desert in Silliman's Journal (2d ser. XIX, Ja. 1855). Arthur Schott mentions a severe earthquake which occurred November 29, 1852, and quotes from manuscripts by Major Heintzelman, as follows: "There exists, about 45 miles below Fort Yuma, in the desert between the western Cordilleras and the Colorado, a pond, considered as an old orifice, which had been closed for several years. The first shock of an earthquake, in 1852, caused a mighty explosion. The steam rose a beautiful snowy jet more than 1,000 feet high into the air, where it spread high above the mountains, gradually disappearing as a white cloud. This phenomenon repeated itself several times in a diminishing scale. Three months later I visited the place; jets took place at irregular intervals, from 15 to 20 minutes. The effect was beautiful, as they rose mingled with the black mud of the pond. The temperature of the water in the principal pond was 118 degrees F., in the smaller one 135, and in one of the mud holes, from which gases escaped, 170. The air which escaped was full of sulphurated hydrogen, and in the crevices crystals of yellow sulphur were found. The

ground near about was covered with a white efflorescence, tinged with red and yellow. On the edge of a small pond crystals of sal ammonia, 1 to 5 inches long, were collected."

At the time of this earthquake low grounds near Yuma became full of cracks, many of which spouted out sulphurous water, mud, and sand. Dr. Parry records that the river formed new bends, leaving portions of its old bed so suddenly that thousands of fishes were left lying on the muddy bottom to infect in a few days the air along the river by their putrefaction, and that the frequency of earthquakes occurring here forms also a point in the mythology and traditional tales of the aborigines.

SOME DESERT FOSSILS.

AMNICOLA LONGINQUA Gld.

Shell elongate ovate, horn colored, surface quite smooth; apex obtuse; whorls 5, well rounded; sutures deep, aperture elliptical, broadly rounded posteriorly; lip simple, copiously incrusting the pillar margin, which is profoundly arcuate; umbilical region nearly perforate. Length one-eighth, breadth one-tenth inch.

Living: Utah.—Henry Hemphill.

Quaternary: Cienega Grande, Colorado Desert.—W. P. Blake. Lahontan basin, Lassen county, Calif., Nevada.

AMNICOLA PROTEA Gould.

Quaternary: Colorado Desert (Orcutt).

Melania exigua Conrad, Phila ac pr 7:269 (F 1855):—"Turreted; volutions 8, disposed to be angulate and somewhat scalariform above; cancellated, longitudinal lines wanting on the lower half of the body whorl; columella reflected; aperture elliptical. Length, one-fifth of an inch. Colorado Desert, California.—Dr. Le Conte. The specimens are numerous and of a chalky whiteness, showing that they are all dead shells."

Living: Dos Palmas spring, Colorado Desert, near Salton (Orcutt).

The most numerous of all the fossil shells found on the desert, and though one of the smallest species, its numbers are so great as to exceed the others in bulk as well.

GNATHODON MENDICUS Gould.

Living: Colorado estuary to Mazatlan, Mexico.

Quaternary: North of Carrizo creek, Colorado Desert.—Le Conte.

PHYSA HUMEROSA Gld.

Living: Colorado river; Pyramid lake, Nevada; Pecos river, Texas.

Quaternary: Near Carson, Nevada. Very abundant on the Colorado Desert in a "semi-silicified" condition.

Virtually only a distorted form of P. heterostropha; evidently the same form occurs living in the Dos Palmas springs, Colorado Desert.

PLANOSBIS AMMON Gould.

Shell large, discoid, subconic, delicately striate; left side broadly and deeply concave, showing 4 obtusely carinated whorls; right side concave, showing 2½ rounded whorls; aperture ovate triangular, sometimes quite expanded on each side; axis, five-eighths to one; diameter ¼ to ½ inch.

Living: Klamath lake, Oregon. Honey lake, Lassen county, Calif. Nevada, Colorado river.

Quaternary: Cienega Grande, Colorado Desert.—T. H. Webb; W. P. Blake, Lahontan basin, Lassen county, California.

TRYONIA CLATHRATA Stimpson.

Shell elongated, narrow; apex of spire acute; sutures deeply impressed; whorls 8, with generally about 12 longitudinal ribs crossing them, sometimes crossed by revolving striae or ridges, and angulated in the middle; aperture rounded oval, very small; diameter, 1.5; altitude 5 mm.

Quaternary: Dry lake, Colorado Desert.

ANODONTA CALIFORNIENSIS Lea.

CHAMA EXOGYRA Conr.

Conrad Phila ac J 1837, 256.

Living: Bodega bay, Calif. to Baja California. Mazatlan?

Quaternary: Santa Barbara to San Diego, Calif. Borrego springs, Colorado Desert (Orcutt). San Nicholas Island (S. Bowers).

RANELLA CALIFORNICA Hinds.

Hinds. Ann Nat Hist 11:255 (1843); Zool Sulphur 12, t 2, f 4, 5.

Keep, West coast shells, 44, f 24.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: Dead Man's Island, San Pedro, Calif. (S. Bowers). Borrego springs, Colorado Desert (Orcutt).

POMAULAX UNDOSUS Wood.

Living: Santa Barbara, Calif. to Cape San Lucas.

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California. Borrego springs, Colorado Desert (Orcutt).

PECTEN AEQUISULCATUS Cpr.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: San Diego, Calif. Borrego springs, Colorado Desert (Orcutt).

VENUS SIMILLIMA Sby.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California (Orcutt). Borrego springs, Colorado Desert (Orcutt).

TIVELA CRASSATELLOIDES Conr.

Living: Santa Cruz, Calif. to Santa Domingo, Baja California (Orcutt).

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California (Orcutt). Borrego springs, Colorado Desert (Orcutt).

OSTREA TITAN Conrad.

Miocene: Carrizo creek, Calif.

OSTREA HEERMANNI Conrad.

Miocene: Carrizo creek, Calif.

OSTREA VESPERTINA Conrad.

Ovate-subfalcate; lower valve plated or ribbed; hinge long and wide, sharp

and somewhat pointed; ligament cavity wide, profound, minutely wrinkled; margins abrupt; cavity not very deep; muscular impressions large, impressed; upper valve flat, irregular; pallial impression crenulated.

Miocene: Carrizo creek, and near San Diego, California.

ANOMIA SUBCOSTATA Conrad.

Obtusely ovate, rather thick; umbo of larger valve ventricose; hinge thickened, surface of the valve obtusely undulated concentrically, and marked with waved, wrinkled, interrupted ribs, much raised, except towards the base, where they are larger and somewhat tuberculiform; upper valve entire, or with obsolete radii towards the base.

Miocene: Carrizo creek, San Diego county, Calif.

OCINEBRA POULSONII Nutt.

SOLECURTUS CALIFORNIANUS Conr.

PECTEN DESERTI Conrad.

Miocene: Carrizo creek, Calif.

EDITORIAL.

The year 1900 has seen the addition of 140 pages to the volumes of the West American Scientist—far less than we had hoped but not a bad showing in the face of the difficulties we have met with.

It is our purpose to bring together in these pages descriptions of all the animals, plants, minerals, etc. of the west, together with notes of economic and geographic significance, bibliography, synonymy, etc.

The cooperation of our readers is invited, and our services in turn we offer in determining names of minerals, sheils and plants, or in any way that may tend to increase interest in these branches.

BOOKS.

MURRAY, D. A.: Atoms and energies. 1901. 202 pp. $1.25 cl. Introduction by Prof. Frederick Starr.

An interesting discussion in physical science, aiming at simple explanations of phenomena little understood, rendering them less mysterious to the average student; "his assumptions not antagonistic to facts, but aid in the explanation of them".

New York, 150 Fifth ave.: A. S. Barnes & Co.

HARPER, GEORGE W.: How to determine and classify our common rocks. 14 pp. 10c.

REMARK, FERDINAND:
—Der Kakteen freund. 33 p. 34 f. 50c.

HIRSCHT, KARL:
—Kakteenkulturen im Hause und ihr Wert. 1896. 32 p. 1 f. 50c.

RUMPLER, THEODOR:
—et Karl Schumann: Die Sukkulenten. Berlin 1892. 263 p. 139 f. $3.

LABOURET, J.:
—Monographie de la famille des Cactees. Paris. 684 p. 1853.

SHIMCK, B.:
—The distribution of forest trees in Iowa. Ia ac pr 7:47-59. Reprint. 1 map. 20c.

EATON, ELON HOWARD:
—Birds of Western New York. Rochester ac pr 4: 1-64. F 1901.

PECK, CHARLES H.:
—Report of the state botanist on edible fungi of New York. Memoir N. Y. state museum 3: 129-234. t 44-68. n 1900.

From the author.

WATTS, W. L.:
—Oil and gas yielding formations of California. State mining bureau b 19. 236 p. Illustrations and maps.

MINERALS.

Twelve years ago the writer contributed to the San Diego Union a brief annotated list of the minerals then known in San Diego county. The county has since been divided into two, but more, rather than less, territory is now tributary to San Diego, hence the present list will not be confined to the arbitrary limits of the county, but to the territory naturally tributary to our bay.

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

ACTINOLITE—Abundant in the Colorado desert.

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

ALABASTER—An abundance of apparently good quality of this form of gypsum occurs on the Colorado desert, and in Baja California.

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

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

ALUM—See kalinite.

AMAZONSTONE—A beautiful 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.

AMBER—See succinite.

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

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

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

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

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

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

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

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

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

ASBESTOS—A four-foot vein seven miles east of Elsinore, Cal., has been worked to a considerable extent, and the product manufactured into boiler covering, etc. Other deposits exist in the mountains bordering the Colorado desert on the west, but the demand on this coast seems not to justify their development at present.

ASPHALTUM—Occurs native at various points along the coast from San Diego northward. California produced in 1896 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.

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

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

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

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

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

CALCITE—Carbonate of lime, consisting of lime and carbonic acid. 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 anclents—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.

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

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

CHALCEDONY — An uncrystalized translucent or clouded variety of quartz, white, yellow, brown or blue (usually whitish), having a luster nearly like wax. When arranged in stripes or layers of different colors it constitutes agate; and if the stripes are all horizontal, it is called onyx. Portions of the Colorado desert in San Diego county are strewn with water-worn fragments of chalcedony of different colors, acres of the mesa-like formation, near the boundary line between the United States and Mexico, being covered with pebbles of every conceivable color and as smoothly laid as a piece of mosaic work.

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

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

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.

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.

CORUNDUM—Reported from Los Angeles county by Dana.

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

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

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

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

DUMORTIERITE: Reported by Durden as occuring 25 miles from Ogilby, on the Colorado desert.

A beautiful variety is found near San Diego.

EMERALD:

True emeralds have been found in North Carolina.

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

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

FLUORITE—Colorado desert, in a massive form.

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

GARNET—See Almandite.

GILSONITE—A hydrocarbon, reported from Utah and Southern California.

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

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.

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

INDICOLITE—Blue tourmalines are reported as 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.

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

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

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

LEUCITE:

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

'Another extra-European locality for leucite is now announced by Von Chrustschoff, who finds it in a lava in the vicinity of the extinct volcano Cerro de las Virgenes in Baja California. The rock consists of an ash-gray ground mass sprinkled with rounded spots of brownish-black obsidian or glass, and with light specks of leucite These light specks are shown by a lens to have a rounded octagonal outline.

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

OPAL—Occurs on the Colorado desert, and also credited to the limits of the city of San Diego, but only the inferior varieties are yet known in California. Banded opal has been described as occurring in Beaver valley, Utah, some three miles from Granite Peak. See hyalite.

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

PERIDOT—New Mexico.

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.

PLUMBAGO—See graphite.

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

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

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

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

Diatomaceous earth occurs on the sea coast near San Diego.

RHODONITE—"Between San Diego and Colton."

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

RUBY:

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

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

RUTILE—This rare mineral was discovered by the writer at Mesa Grande

SALT—See halite.

SCHORL—Black tourmaline; quite common in San Diego county and in Baja California, disseminated through

quartz or feldspar. Crystals six inches in diameter have been observed.

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

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

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

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

METALS MORE PRECIOUS THAN GOLD.

The value in 1898 per gram is given —as quoted in the European market.

Barium, $5.71

Beryllium, crystals, $9 04

Boron, crystals, $1.43

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

Calcium, $4.28

Cerium, $2.02

Didymium, $2.81

Erbium, $3.06

Gallium, $615 per grain.

Germanium, $35.70

Glucinium, $9.04

Indium, $4.05

Iridium, $1.19

Lanthanum, powder, $4.28

Lithium, $2.38

Niobium, $3.81

Osmium, $2.87

Palladium, $761 per kg. for sheet and wire.

Rhodium, $2.87

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

Ruthenium, $1.55

Strontium, $6.19

Tantalium, $3.57

Titanium, $.71

Vanadium, $1.43

Yttrium, $3.33

Zirconium, $0.71

PERIODICALS.

FARM AND FIRESIDE:
SENTINEL: Ramona, Cal.
VERMONT JOURNAL: Windsor, Vt.

BIOGRAPHICAL.

ROTHWELL, RICHARD P.
Died April 17, 1901. Editor for years of the Engineering and Mining Journal, and of the annual mining publication, Mineral Industry, and well and favorably known in every civilized country where mining exists.

MAGAZINES.

CURRENT ADVERTISING:
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Journal of the northwest mining association. $1 a yr. Monthly.

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A free milling gold "prospect" has been placed in our hands for sale, said to have an 85-foot shaft, and other workings, with a 5-foot ledge of ore assaying $12.50 per ton. Good roads, wood and water. Price, $20,000. An examination and conservative report will be made on reasonable terms. Address the editor.

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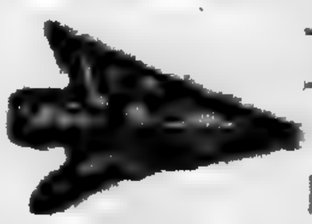

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L. W. STILWELL, Deadwood (Black Hills), South Dakota. 8

COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphytite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at $6 per ton on small shipments; smelting charges $6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at $13.

A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 30 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to $3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for $2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of $1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, $50,000; six months' developing bond; shipping privileges.

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40 named tertiary fossils, $3

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——entom b 1st ser
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Mines examined. Conservative reports furnished. Rare minerals, meteorites, gems, pearls, etc. wanted
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OIL

The editor reported to the State mining bureau in 1890 (10th report, 905), on the Colorado Desert:— 'The formation in certain sections seems very promising [for the producing of petroleum].

About half a million acres have been taken up for oil in the past few months. The editor is in a company claiming over 20,000 acres. Yes, stock will soon be for sale. Land also.

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BIOGRAPHICAL.

Le CONTE, JOSEPH:
One of the most eminent scientists, of the University of California, died July 6, 1901.

Shells of western Lake and Stream.

ACROLOXUS NUTTALLI Hald.
Keep, West Coast shells, 115, f. 109.
Shell fuscous, oval, elevated, apex ¼ of the entire length from one end. Length 8, width 6.25, height 3 mm.
Living: Snake river, Idaho; Oregon; Washington.

ANCYLUS ALTUS Tryon.
Shell somewhat oblong, broadly rounded at one end more narrowly so at the other; convexly much elevated, apex obtuse, subcentral, texture delicate, surface rather smooth. Length 8, width 6, height 4 mm.
Living: Klamath river, California.

ANCYLUS CAURINUS W. Cooper.
Living: Black river, Puget Sound, to Sierra Nevada mountains, California.
Considered by Tryon as identical with A. fragilis.

ANCYLUS CRASSUS Hald.
Shell coarse, somewhat ponderous, ovate, elevated; lines of growth conspicuous; apex eroded, placed far back; anterior and lateral slopes convex, posterior slope steep and rectilinear. Color opaque chestnut-brown. Length 8, width 6.25, height 3 mm.
Living: Oregon (Nuttall).

ANCYLUS FRAGILIS Tryon.
Shell very fragile, sides nearly parallel or slightly incurved in the middle, diverging anteriorly; ends rounded, apex elevated, acute, curved backwards, with about two-thirds of the shell anterior to it. Length 4, width 1.5, height 1 mm.
Living: Vallejo and coast region, California.

ANCYLUS KOOTANIENSIS Baird.
Shell ovate, ashy, concentrically striate, vortex anterior, obtuse, shining wthin. Length 9, width 6 mm.
Living: Kootanie and Spokane rivers, British Columbia.

ANCYLUS NEWBERRYI Lea.
Shell obtusely pyramidal, dark, reddish-brown, slightly compressed at the sides; apex subcentral, aperture elliptical. Length 13.8, width 10, height 5 mm.
Living: Klamath lake, Pitt river, California; Oregon.

ANCYLUS UNTTALLI Hald.
Living: Oregon.

ANCYLUS PATELLOIDES Lea.
Shell thick, elliptical, spotted, obliquely conical; striae minute, crowded; apex submedial.
Living: Arroyo San Antonio (Trask); Santa Cruz; Canoe creek; San Francisco; upper Sacramento river, California. Oregon.

ANCYLUS SUBROTUNDUS Tryon.
Shell very fragile, oval, nearly round; convex, but little elevated; apex obtuse, nearly central. Length 8, width 6.5, height 3 mm.
Living: Umpqua river, Oregon.

BYTHINELLA BINNEYI TRYON.
Shell elongated, 4-5 whorls, apex somewhat obtuse; aperture ovate or nearly suborbicular, both margins rounded; umbilicus very small. Color light horn, translucent. Height 3, diameter 1.6 mm.
Living: Bolinas; Martinez; Santa Cruz; Campo, San Diego county (Orcutt), California.

BYTHINELLA HEMPHILLI Pilsbry.
Shell very slender, about the shape of Carychium exiguum. Apex obtuse, whorls 5, convex, the last imperforate. Aperture ovate, about one-third the length of the shell; peristome continu-

ous, its plane oblique to the axis of the shell, the base of the lip being advanced. Color corneous, often encrusted with a black ferrugineous deposit. Height 2.4, diameter 1 mm.

Living: Snake river, Washington (Henry Hemphill).

Pilsbry, Nautilus 4: 63-64.

BYTHINELLA INTERMEDIA Tryon.

Shell elongately turbinated, of over 4 very convex whorls; spire elevated, suture profound, apex obtuse; body whorl well rounded; aperture small, nearly round; umbilicus narrow. Color dark green. Height 5, diameter 2.3 mm.

Living: Owyhee river, southeastern Oregon. Springs, Cuyamaca mountains east of San Diego, California (Orcutt).

CARINIFEX NEWBERRYI Lea.

Keep, West Coast shells, 115, f 104.

Shell light horn color, turreted, very minutely striated, above and below acutely carinated, broadly and deeply umbilicated, whorls 5, flat above, sloping convex below; aperture large, subtriangular.

Living: Klamath lakes, Oregon, to Owens river and Clear lake, California. Nevada. Utah.

COCHLIOPA ROWELLII Tryon.

Shell depressed, wider than high, whorls 3½, regularly convex, rapidly enlarging; spire small, slightly elevated, apex acute, sutures well marked; base convex, except that region around umbilicus is flattened and inclined toward the axis, its outer boundary marked thus by an angle; umbilicus small, very distinct; aperture half ovate, labrum well rounded, thin, labium slightly rounded, thickened, elevated from body whorl forming an acute angle with the labrum above, and not impinging on the umbilicus. Color yellowish-green. Operculum paucispiral. Height 2½, larger diameter 4, smaller 3 mm.

Living: Clear lake, California? Panama?

FLUMINICOLA FUSCA Haldeman.

Globose, smooth, whorls 5, rapidly increasing, sutures very deeply impressed; aperture large, broadly ovate, columella thickened. Color horn to light greenish. Height 10, diameter 8.6 mm.

Living: Sacramento river, California. Green river, Utah. Oregon. Wyoming. Dakotas.

FLUMINICOLA HINDSI Baird.

Keep, West Coast shells, 63.

Living: Kootanie river, Montana.

FLUMINICOLA NUTTALIANA Lea.

Keep, West Coast shells, 63, f 50.

Shell globosely turbinate, thick, whorls 4 (apex generally eroded), convex, sutures well impressed; aperture large, widely ovate. Greenish, aperture blue within. Height 10, diameter 9.3 mm.

Living: British Columbia; Sacramento river, California.

FLUMINICOLA VIRENS Lea.

Keep, West Coast shells, 63.

Shell oval, thick, apex eroded, whorls 4—5, moderately convex; aperture narrow-ovate. Bright green, bluish within. Height 10, diameter 6 mm.

Living: Oregon and northern California.

GUNDLACHIA CALIFORNICA Rowell.

Aperture suboval, obliquely expanded towards the left, posteriorly rounded, and wider anteriorly. Internal shelf reaching forward about one-fifth the length of the shell, its margin slightly concave and oblique. Dorsal surface convex, becoming somewhat keel-shaped towards the apex, which is strongly and obliquely deflected so as to make the right border nearly a straight line, while the expansion on the left projects nearly as far back as the apex at an obtuse angle. Structure corneous, with strong concentric lines of growth and faint radiating striae. Color dark brown, opaque; inner surface shining and purplish, the plate white towards the edge, and in some specimens showing a thickened, white semicircle continuous with its margin across the arch of the shell. Length 4, width 2, altitude 1.5 mm.

Living: On stems of plants growing in stagnant ponds, California, often two or more on the back of another.

LIMNAEA ADELINAE Tryon.

Shell thin, semi-transparent, body whorl large, wide, convex; spire small, consisting of 5 convex volutions, attenuating rapidly to an acute apex, sutures impressed; inner lip thin, reflected, but not covering the umbilical fissure, which is narrow; columella twisted; color light horn, polished within the aperture, outer lip tinged with red within. Length 14, diameter 8.5 mm.

Living: San Francisco; San Diego (Orcutt), California. Tijuana, Baja California (Orcutt).

LIMNAEA BULIMOIDES Lea.

Living: Upper Missouri river to Columbia river. San Diego, California.

LIMNAEA CAPERATA SAY.

Living: New York; Massachusetts; Michigan; to Hudson bay, and northern California.

LIMNAEA EMARGINATA Say.

Shell ovate-conic, thin, translucent, smooth; lines of growth very fine; whorls 5, very convex, suture deep; apex acute when present; aperture wide, more than ½ the length of shell; labium turned over, so as to form an umbilic; fold on columella obsolete; columellar depression deeply emarginate. Color light ochraceous.

Living: Maine; Lake Winnipeg; Washington?

LIMNAEA HUMILIS Say.

Living: Throughout the United States. Baja California (Orcutt). Vancouver island.

LIMNAEA LEPIDA Gould.

Living: Columbia river, to Antioch, California.

LIMNAEA PALUSTRIS Mueller.

Living: Circumboreal; Mountain lake, California; New Mexico.

LIMNAEA STAGNALIS L.

Living: Europe; Siberia; Ohio to Oregon. California.

NERITINA PICTA Sby.
Cooper, Cal as pr 2d ser, 3:103.
Living: Guaymas (Orcutt). Todos Santos creek, Baja California (L. Belding).

PHYSA AMPULLACEA Gould.
Shell ovate-ventricose, shining, horn-colored; spire elevated, acute; whorls 6, last one inflated; suture decidedly impressed; aperture broadly ovate, five-sixths the length of the shell; lip thin, submargined with red; columella quite flexuous, covered with callus. Length 25, diameter 13 mm.
Living: Lake Oyosa, Washington; Oregon.

PHYSA DIAPHANA Tryon.
Cooper, Cal ac pr 2d ser, 3:103. Zoe 1:196.

PHYSA DISTINGUENDA Tryon.
Shell variable in outline, sometimes cylindrical, sometimes more inflated, lengthened; spire some longer than in P. malleata; whorls convex, suture well impressed; surface malleated, crowded with growth lines; aperture long, narrow, rather wider below, columella long, narrow, white, almost without fold, turned a little to the right below. Length 13 diameter 7 mm.
Living: Marysville, Stockton, San Diego, California. Tijuana, Baja California (Orcutt).

PHYSA GABBII Tryon.
Shell thin, closely striated by the lines of growth; body whorl inflated, its upper half flattened, so that the lip appears angulated in the middle; spire moderate, apex acute, whorls 6, convex, with distinct sutures. Color light corneous, very much polished within; lip margined with red. Length 25, diameter 13 mm.
Keep, West Coast shells, 119.
Living: Mountain lake; Santa Ana river, California. Baja California.

PHYSA HUMEROSA Gld.
Shell subrhomboidal, solid, smooth and white; spire acute; whorls 5, tabulated; aperture one-half to two-thirds length of shell, rounded posteriorly; labrum expanded; columella scarcely plicate, callus hardly perforate. Length 15, diameter 9 mm.
Living: Colorado river; Pyramid lake, Nevada; Pecos river, Texas.
Quaternary: Near Carson, Nevada Very abundant on the Colorado Desert in a "semi-silicified" condition.
Virtually only a distorted form of P. heterostropha; evidently the same form occurs living in the Dos Palmas springs, Colorado Desert.

PHYSA LORDI Baird.
Shell thin, corneous, tumid, gibbous, aperture large, outer lip acute; external surface very minutely decussated; whorls 3, first 2 minute, tinged with black, the last swollen, 4 times the size of the others. Length 13-25, diameter 12-18 mm.
Living: Lake Osoyoos, British Columbia. Washington. Humboldt lake Nevada.

PHYSA TRASKII Lea.
Shell very much inflated, somewhat oblique striate, semi-transparent very thin, pale chestnut color; spire somewhat produced, pointed at the apex; sutures impressed; whorls 6, the last one very large and very much inflated; aperture broadly expanded; outer lip acute, and within the margin brown-banded; columella impressed in the middle and furnished with a large fold. Length 9, diameter 12 mm. Los Angeles river, California.

PHYSA VIRGATA Gould.
Shell moderate, solid, smooth, elongate-ovate, ash-colored with longitudinal olivaceous stripes; spire elevated, acute; whorls 4-5, well separated; aperture lunate, two-thirds the length of shell; columella moderately folded, with a heavy callus, within yellowish-red. Length 10, diameter 6 mm.
Living: Gila river, Arizona (T. H. Webb). Los Angeles and San Diego, California.

PISIDIUM OCCIDENTALE Newc.
Sierra Laguna, Baja California.
Cooper, Cal ac pr 2d ser, 3:217. Zoe 1:197.

PLANORBIS AMMON Gould.
Shell large, discoid, subconic, delicately striate; left side broadly and deeply concave, showing 4 obtusely carinated whorls; right side concave, showing 2½ rounded whorls; aperture ovate triangular, sometimes quite expanded on each side; axis, five-eighths to one; diameter ¼ to ½ inch.
Living: Klamath lake, Oregon. Honey lake, Lassen county, Calif. Nevada, Colorado river.
Quaternary: Cienega Grande, Colorado Desert.—T. H. Webb; W. P. Blake. Lahontan basin, Lassen county, California.

PLANORBIS ANITENSIS Cp.
"Shell (when held mouth downward) with the right side concavo-convex, the left flat (or slightly concave), the left margin forming a sharp carina expanded beyond the edge of shell, which is marked by a compressed line. Whorls 5, visible on both sides, uniformly flat on the left side, forming a concave umbilicus on the right, where their surface is rounded. Mouth triangular, the right lip arched, the left nearly flat, the extremities joined to outer angle and to obtuse margin of umbilical cavity. Umbilicus half as wide as the shell; flat side of mauth one-fourth of diameter; greatest breadth (at mouth) over one-fifth of same; greater diameter 0.26, letst 0.03 inch."—Cooper, Cal ac pr 2d ser, 3: 341.
Type locality: Laguna at Santa Anita, Baja California, at an elevation of 100 feet, and 10 miles from San Jose del Cabo.

PLANORBIS BINNEYI Tryon.
Living: Oregon; Washington.

PLANORBIS HORNII Tryon.
Shell of three convex volutions; aperture almost orbicular, not oblique, nor extending above or below the plane of the whorls; labrum slightly reflected, thickened within, its ends converging so as nearly to connect on the parietal wall; lines of growth fine and close. Color light horn. Diameter 21, height 7 mm.
Living: Fort Simpson, British America (George H. Horn). Grant's lake, California (W. M. Gabb).

PLANORBIS OPERCULARIS Gould.

Shell dextral, much depressed, lenticular, with a prominent blunted keel at compressed line; tip sunken; beneath the periphery defined by a marginal, compressed line; tip sunken; beneath umbilicated for about one-third the breadth of the base, showing 3 volutions, convex, surface rather rude and indented, marked with irregular, coarse, much arcuated lines of growth, and here and there a few obscure, raised revolving lines; color dark chestnut brown, a little clouded; whorls above 4, slightly convex; suture well defined, impressed; aperture transversely subrhombic, lip above slightly declining, at periphery acute-angled, beneath arched, lips embracing ¾ of that part of the whorl which is beneath the carina. Diameter 6, height 1.5 mm.

Living: Common in the waters of California. Vancouver island.

PLANORBIS PARVUS Say.

Living: All British America and United States. Manitoba to New Mexico. Cantillas canyon, Baja California (Orcutt).

PLANORBIS PENINSULARIS Cp.

"Shell with both sides concave, the right with whorls rounded, their edge forming an obtuse margin, and the outer one partly enclosing the others so that it forms two-thirds the greater diameter of shell. Whorls 5, visible on both sides, the rounded (or right) surface showing less of them than the other. Left (or umbilical?) surface nearly flat, deeply concave near middle, the umbilicus being over one-third of diameter. Mouth trapezoidal, very oblique, its lips curved, the right extremity attached near the concave spire, the left to the obtuse periphery of shell. Mouth one-third longer than wide; its bredth over one-third that of shell. Greater diameter 0.16, least 0.05 inch. Color brown, surface smooth."—Cooper, Cal. ac pr 2d ser. 3: 342.

Type locality: "With P. anitensis, in some laguna."

PLANORBIS SUBCRENATUS Cpr.

Shell tumid, very thin, horn-colored; whorls 6, rounded, sutures impressed; with sharp radiating, somewhat crowded and occasionally minutely crenulated ridges; aperture rounded, parietal wall small scarcely touching the penultimate whorl; labrum slightly deflected, fusion within; umbilicus deep. Diameter 12, height 9 mm.

Living: Oregon (Nuttall). British Columbia to Baja California.

PLANORBIS TUMENS Cpr.

Shell rapidly swelling, horn or reddish smoke-colored; whorls 4 or 5, with light waving striae; sutures deeply impressed; on one side subangulate or subcarinate near the suture, on the other rounded; umbilicus very deep; aperture with a sinuous edge, one side standing out above, flattened below, the other flattened above, produced below, capacious and rounded; labrum very thin. Diameter 15, height 6.5 mm.

Living: Mazatlan; Baja California; San Francisco, Petaluma, and southern California.

PLANORBIS TUMIDUS Pfeiffer.

Shell opaque, pale horn colored or smoky, densely and finely striated, umbilicated above, slightly concave below; whorls 5, convex, subcarinated on each side, rapidly increasing, separated by a deep suture; aperture oblique, lunate-rounded, somewhat kidney-shaped. Diameter 19, height 6 mm.

Living: Texas. Los Angeles, California. Nicaragua (T. Brydges). Guatemala.

PLANORBIS VERMICULARIS Gould.

Shell dome-shaped, minutely striated by growth, whorls 4, the last one deflected near the aperture, rounded at periphery, tip depressed, suture very deep, the whorls sloping towards it; base cup-shaped, exhibiting all the whorls. Aperture exhibiting a very oblique section of a cylinder; lip embracing about ½ the height of the last whorl and joined by callus. Height 1.6, diameter 5 mm.

Living: Oregon; California; Baja California (Orcutt).

POMPHOLYX EFFUSA Lea.

Shell roundly gibbous, rather thin, effuse, reddish horn-colored or greenish, whorls 5, flattened above, concave below; aperture subrotund, dilated, white within. Length 6, diameter 8 mm.

Keep, West Coast shells, 116, f 103.

Living: Pitt river, Modoc county, to Lake Tahoe, California. Pyramid lake, White Pine, Nevada (Henry Hemphill).

POMPHOLYX SOLIDA Dall.

Living: Fish Springs, Owens river valley, California.

TRYONIA CLATHRATA Stimpson.

Shell elongated, narrow; apex of spire acute; sutures deeply impressed; whorls 8, with generally about 12 longitudinal ribs crossing them, sometimes crossed by revolving striae or ridges, and angulated in the middle; aperture rounded oval, very small; diameter, 1.5; altitude 5 mm.

Quaternary: Dry lake, Colorado Desert.

AMNICOLA LONGINQUA Gld.

Shell elongate ovate, horn colored, surface quite smooth; apex obtuse; whorls 5, well rounded; sutures deep, aperture elliptical, broadly rounded posteriorly; lip simple, copiously incrusting the pillar margin, which is profoundly arcuate; umbilical region nearly perforate. Length one-eighth, breadth one-tenth inch.

Living: Utah.—Henry Hemphill.

Quaternary: Cienega Grande, Colorado Desert.—W. P. Blake. Lahontan basin, Lassen county, Calif., Nevada.

VALVATA VIRENS Tryon.

Shell turbiniform, of 4 well-rounded whorls; spire elevated, apex acute, sutures deeply indented, periphery almost angulated; umbilicus very wide; aperture oval or nearly round, the peristome merely touching the body above. Surface closely striate. Color brilliant to dark green. Height 5, diameter 5 mm.

Living: Clear lake, California. Utah lake.

C. R. ORCUTT.

EXCHANGES.

Brief notices inserted free for subscribers.

Brunetti, E.:
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North American Diptera maunted on long pins wanted in exchange for European and other insects, stamps, etc.

DOE, ALBION:
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Shells to exchange for shells.

Fruhstorfer, H.:
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North American Papilionidae, Pieridae, Parnassus and Lycaenidae wanted in exchange for showy Papilionidae from Java. Butterflies, beetles, tnd other insects in perfect condition, carefully named, for sale cheap.

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FARM AND FIRESIDE:
SENTINEL: Ramona, Cal.
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MAGAZINES.

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Journal of the northwest mining association. $1 a yr. Monthly.
OHIO NATURALIST: Columbus, O.
Published by the biological club of the Ohio state university. 50c a year of 8 numbers.
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REAL ESTATE.

WITCH CREEK 9 rooms, 2 A. table grapes, 7 assorted fruits, 16x24 barn with stone basement, water, wood, near hotel, school, stage, store, etc.—all for less than cost of improvements, $3000

ORCUTT, San Diego, California.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection; 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 3,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bottom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for $2,500.00 a year—optional with purchaser to take possession in 30 days. Price $8.00 an acre.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

Six square leagues (26,628 acres) of fertile land, with creeks of running water and perennial springs, an old adobe house, and primeval orchard of olives, oranges, lemons, figs and grapes, situated in Mexico, about 20 miles south and east of San Diego City, California, is an estate that might well captivate the fancy of any eastern home seeker.

One-third of the land is adapted to cultivation, the balance grazing land. Quartz and placer gold mines, mineral water, abundant wood, and a perfect climate, are among the attractions.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

EDITORIAL.

It is our purpose to bring together in these pages descriptions of all the animals, plants, minerals, etc. of the west, together with notes of economic and geographic significance, bibliography, synonymy, etc.

The cooperation of our readers is invited and our services in turn we offer

in determining names of minerals, shells and plants, or in any way that may tend to increase interest in these branches.

Scientific Societies.

AMER. MUSEUM of NAT. HISTORY:
ARGENTINA REPUBLIC: Museo Nacional de Buenos Aires.
—Comunicaciones. Vol. 1, No. 8.
AUSTRALIAN MUSEUM:
Report of trustees for 1899.
CALIFORNIA ACADEMY of SCIENCES:
CANADIAN INSTITUTE:
CINCINATI SOC'Y of Natural History:
COLORADO College Scientific Society:
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MISSOURI BOTANICAL GARDEN:
Twelth report, 1901.
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ORCUTT, San Diego, California.

QUEER THINGS.

Scorpio allenii, scorpion, 30 c.
Trap-door spider 25c, nest (portion with lid) 25c.
Crabs 5c to $1—also other crustacea, barnacles &c
Echinarachnius excentricus, flat sea-urchin or 'sand dollar,' with or without spines, 5 @ 20c
Strongylocentrotus purpuratus 10 @ 50c.
Egg of Leopard shark, Heterodontus francisi, odd, resembles a piece of twisted glue, 15c.
Devil fish, Octopus punctatus, 50c
Goose barnacles, very odd, 10c
Feather moss, Aglaophenia struthionides, 25c.
Pinus Torreyana cone. 35c

COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.
Good roads from Silver City to the mines.
Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphytite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.
Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.
Ore can be marketed at the Silver City reduction works.
Cost of mining, assaying and hauling to Silver City estimated at $6 per ton on small shipments; smelting charges $6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.
Net profit per ton (on a 10 per cent. ore) estimated at $13.
A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.
The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 38 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.
Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to $3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.
A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.
Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for $2 per cord.
This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of $1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.
Price, $50,000; six months' developing bond; shipping privileges.

ORCUTT, San Diego, California.

LAKESIDE HOTEL

Lakeside, San Diego county, California.

This Hotel is a convenient place to stop on the way to and from the mines.

First Class in every respect.

Telephone and telegraph.

Baths and electric bells.

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40 named tertiary fossils, $3

ORCUTT, San Diego, California.

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ALAMO MINES.

After an absence of ten years your correspondent is again visiting in the mining town of Alamo, Baja California, situated about forty miles south of the older town of the Real del Castillo, and some sevnty miles from Ensenada. After arrival in Ensenada by stage from Tia Juana, making a quick trip in a day and a half from the line. I bought a horse and saddle and two pack burros, and started for the Alamo via La Grulla, the beautiful rancho of Christopher McAleer—now looking sadly neglected, rented to Chinamen for a vegetable garden.

From La Grulla we soon left the wagon road for a trail through wild and beautiful hills, spending Sunday at a little valley called the Sycamores—where wild bees throve amid a wealth of flowers, and where an apparently new species of Ancylus, a tiny water snail, rewarded diligent search among the stones in the clear running stream. The following Monday my guide led me over bushy hills innocent of all vestage of trails to the Santa Clara valley, where the wagon road to the Alamo was again met, and five leagues further on we found ourselves entering upon the one main street of the town—but little changed in outward appearance in the past decade.

But none of its former life seemed to remain in the deserted streets: none of the acquaintances of my former visit greeted my return; the semi-circle of smoke stacks, eight or ten in number, around the town to the south and west were silent from sunrise to sunset, the English, American, Italian, French, Chinese, Mexican and Indian races being about equally represented in the handful of inhabitants.

The history of the Alamo savors somewhat of romance. Tradition says that a red-handed fugitive from justice for some years kept the secret of these rugged peaks, but in a moment of fancied security fell into the hands of the mounted police, and for life and liberty exchanged his tale of gold. The rush from San Diego to the new placers will long remain in the memory of those who participated therein. Basillio Padilla was one of the characters of early days, a keen prospector, who thought nothing of taking out a pound of gold in a day—and spending it at night at the gaming table. His wife, however, was a better prospector than he, saith tradition here, and at her advice he left ground paying $200 a day for ground that yielded $2,000 for a day's labor—in the now abandoned but still famous Mexican gulch. It was this same Mexican who later found a quartz boulder studded with gold, which led to his discovery of the Princesa mine, said to have later yielded in a single pocket half a million of gold dollars.

This same Basillio Padillo had a partner, who, on the sale of the Princesa, pocketed all the money and left for parts unknown. In 1898 many a

San Diego housewife bought fish from a little old peddler with a sick wife who occupied one of my houses gratis. The steamer took the devoted old couple south to the orage groves of Durango, via Mazatlan, and news now comes of the old man having found and sold another mine for $30,000 in gold.

But in my ten days' sojourn a change is creeping over the quiet village. The Aurora Consolidated Mining company has secured control of eighteen of the leading properties. It is credited with having $260,000 in gold in its treasury, and with the announcement of its intention to sink 1,000 feet on the Aurora and Princesa mines, hope is reviving in the hearts of those who have staid by the town.

The Aurora, Ulysses, Montezuma, Telemico, Grand de Oro, Cocinera, Lawrence, Ensenada, India, Princesa, San David, San David No. 2, Penelope, Arbol de Oro, Borracho, Sterling, Spider and Chispa are the names of the mines of the new company, which it is believed will be developed into paying properties under the management of Mr. Mugford.

The Texas mine is in charge of Mr. Miller, but his company has been quiet for the past two years. Mr. Church, with characteristic persistence, is rebuilding a mill on his property single handed, and deserves a part in the bright future now predicted for the camp.

The writer has secured the agency of one of the best groups of mines in the camp, which in earlier days yielded $8,000 to $10,000 gold per month. The owner reached the camp "dead broke" and on sinking to the 100-foot level, found himself unable to continue single-handed, at a profit, and now invites capital to join him in developing the virgin ground beneath.

Edgar Davis, formerly of South Carolina, better known here as "Placer Davis," is doggedly persistent in seeking to win a stake from the sands of the creek, and expresses faith in the future of the camp, and in the merit of the "Scorpion," which has yielded many tons of $500 ore in the past.

In passing, I may mention that F. R. Sawday, formerly of Julian, is now the manager of the Lower California Development company's store at Ensenada, while his son, F. H. Sawday, has charge of the company's branch store in Alamo, and Americans will always find them accommodating and pleasant men to meet. Many things seem high here—bacon $1 a kilo, flour $6 a sack, hay $100 a ton, and other things in proportion, but when one remembers that a United States dollar pays for $2 here, prices do not seem quite so high.

A little stir in the stillness of the place was recently made over the discovery of some new placers five or six miles from here, where several men made very respectable wages for a time with dry washers. Last week, however, one of the heaviest summer storms known in the history of the place, destroyed for a time the infant industry of dry washing for gold. As a guest of J. W. Lee, the leading spirit in this work, I witnessed the operation before the storm, and saw a clean-up of an ounce and a half of virgin gold. Now that his operations are interrupted, Mr. Lee proposed an overland trip with his wife to San Diego, horseback, expecting to ret runagain as soon as the ground becomes sufficiently dry to permit work.

Rev. R. B. Taylor, pastor of the First Presbyterian church of San Diego, is planning to spend his vacation this month on the celebrated Sierra San Pedro de Martias—the highest mountain in the peninsula, rising to the south nearly 11,000 feet above sea level. Antelope, deer and mountain sheep are reported abundant, with wild honey, buried treasures of pearls, gold nuggets, and ancient silver dollars, and lost mines of fabulous richness, among its varied attractions.

A man has recently been reported as killed there by a mountain lion, but such accidents are exceedingly rare. The miles of pine trees, the running water, abundant grass, and the trout stream at its base, renders it the ideal spot for the hunter—one of the few places of its kind that has so far retained all its primeval beauty.

John Gray of Campo has a cattle ranch between here and the big mountain, in the Valle Trinidad, and it was an unexpected pleasure to shake his

hand the other day, when he visited town. My room is decorated with deer and wildcat skins and French flags, having been kindly placed at my service by Mrs. Joseph Goyette, a French Canadian, whose former home was not far north of my own native state, Vermont. The big room has been the scene of many a dance and ball to the governor during the prosperous days of the camp, and near it many a gold nugget has ben picked up in the past. After the recent rains, I found two small nuggets myself in the street, near, and a Mexican boy picked up one worth about a dollar. In earlier days, Jack Lee found one weighing an ounce and a half, and the colored barber next door says he has picked up over $300 worth in a radius of a few hundred feet. The government does not allow digging in the townsite, which chances to have been rich placer ground.

Most of the mines here are considered stringers from a big fissure vein which it is believed will be developed at a depth of 500 to 1,000 feet. The walls are granite, the veins interrupted by syenitic dykes. The best ore consists of magnetite in quartz with free gold. Garnets, epidote, schorl, mica, lead and copper ores, and cinnabar, are among the minerals so far observed. My servant brought me one fine quartz crystal, clear as glass, and three inches in its greater diameter.

Tomorrow I expect again to follow the gentle burro to the mountains—ever in search of the fabulously rich lost mine of the mission fathers—and the beetles, snail and flowers that may lie in my path.

C. R. ORCUTT.

Zwei neue kalifornische Pflanzen.

ALIGERA PATELLIFORMIS sp. nov.

Diese Art gehört zu der Gruppe mit zweilippiger, kurzgespornter Blumenkrone. Pflanze oft 4–5 dm hoch. Krone hell rosenrot mit 2 Punkten auf der Unterlippe. Frucht 3–3.5 mm lang und nicht ganz so breit, auf der Rückenfläche dicht bedeckt mit sehr kurzen Haaren, an der Brustfläche mit einer Haarzeile längs der Naht; Flügel etwa so breit wie der Same, ihre Ränder nur wenig einwärtsgebogen, die Schüssel daher sehr flach; Schnabel sehr kurz nicht über den Flügeln hervorragend.—Auf feuchten oder nassen Plätzen, Stonewall Mine, Cuyamaca-Gebirg, Meereshöhe 4600 F., Juni 1897 (S.B. Parish, Nr. 4539). —Herr Parish hatte die Freundlichkeit mir vor einigen Jahren eine Pflanze zuzesenden, dieselbe hatte jedoch keine Blüten und nur noch wenige Früchte, aber es gelang mir, aus den Samen junge Pflanzen zu ziehen.

COLLINSIA BREVIFLORA sp. nov.

Aufrecht, 2–3 dm hoch, meistens oben verzweigt. Behaarung unten am Stengel sehr kurz, oben länger und drüsig wie am Kelch und Blütenstiel. Blätter fast oder ganz kahl, 2–3 cm lang, lanzettlich bis fast linealisch, stumpf, am Grunde verschmälert, ganzrandig oder etwas gezähnt; oder die untersten kurzhaarig, langgrund und gestielt, der Rand sägezähnig mit grossen, stumpfen Zähnen. Blüten etwa 7 mm lang, oft 6 in einem Quirl. Kelch etwa 5 mm lang; seine Lappen etwas mehr als halb solang, linealisch oder etwas breiter, stumpf oder einige beinahe spitz. Krone unten weisslich mit einigen Längsstreifen, nur unbedeutend gekrümmt und der Schlund nicht stark erweitert; die Lappen hell rotblau, die seitlichen der Unterlippe etwas länger als die übrigen, die 4 ausgebreiteten ungefähr gleichgestaltet, über ihrem Grunde nicht erweitert, am Ende etwas abgestutzt und eingekerbt; Oberlippe unterhalb des Spaltes etwas punktirt. Staubfäden kahl, der verkümmerte fast 5 mm lang und etwas keulenförmig. Fruchtstiel atwa solang wie der Kelch, mitunter auch 2- oder 3-mal solang. Kapsel fast kugelig, viel kürzer als der Kelch, 2 samig. Same 2.5 mm lang, länglich und, dick, mit rauher

Oberfläche. Ockenden, Fresno County, Meereshöhe 5300 F., 1900 (H. M. Hall & H. P. Chandler, Nr. 86).

WILHELM SUKSDORF.

PERIODICALS.

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NAUTILUS:
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OHIO NATURALIST: Columbus, O.
Published by the biological club of the Ohio state university. 50c a year of 8 numbers.
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REAL ESTATE.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection: 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 3,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape: the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bottom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for $2,500.00 a year—optional with purchaser to take possession in 30 days. Price $8.00 an acre.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

Six square leagues (26,628 acres) of fertile land, with creeks of running water and perennial springs, an old adobe house, and primeval orchard of olives, oranges, lemons, figs and grapes, situated in Mexico, about 20 miles south and east of San Diego City, California, is an estate that might well captivate the fancy of any eastern home seeker.

One-third of the land is adapted to cultivation, the balance grazing land. Quartz and placer gold mines, mineral water, abundant wood, and a perfect climate, are among the attractions.

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Just a hope to gild the way,
Just a word to speak of Jesus,
Do you love Him as you may?

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ASTHMALENE Brings Instant Relief and Permanent Cure in All Cases.

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The Rev C.F.WELLS, of Villa Ridge, Ill., says: "Your trial bottle of Asthmalene received in good condition. I cannot tell how thankful I feel for the good derived from it. I was a slave, chained with putrid sore throat and Asthma for ten years. I despaired of ever being cured. I saw your advertisement for the cure of this dreadful and tormenting disease, Asthma, and thought you had over spoken yourselves, but resolved to give it a trial. To my astonishment, the trial acted like a charm. Send me a full-size bottle."

Rev Dr. Morris Wechsler.

Rabbi of the Cong. Bnai Israel.

New York, January 3 1901.

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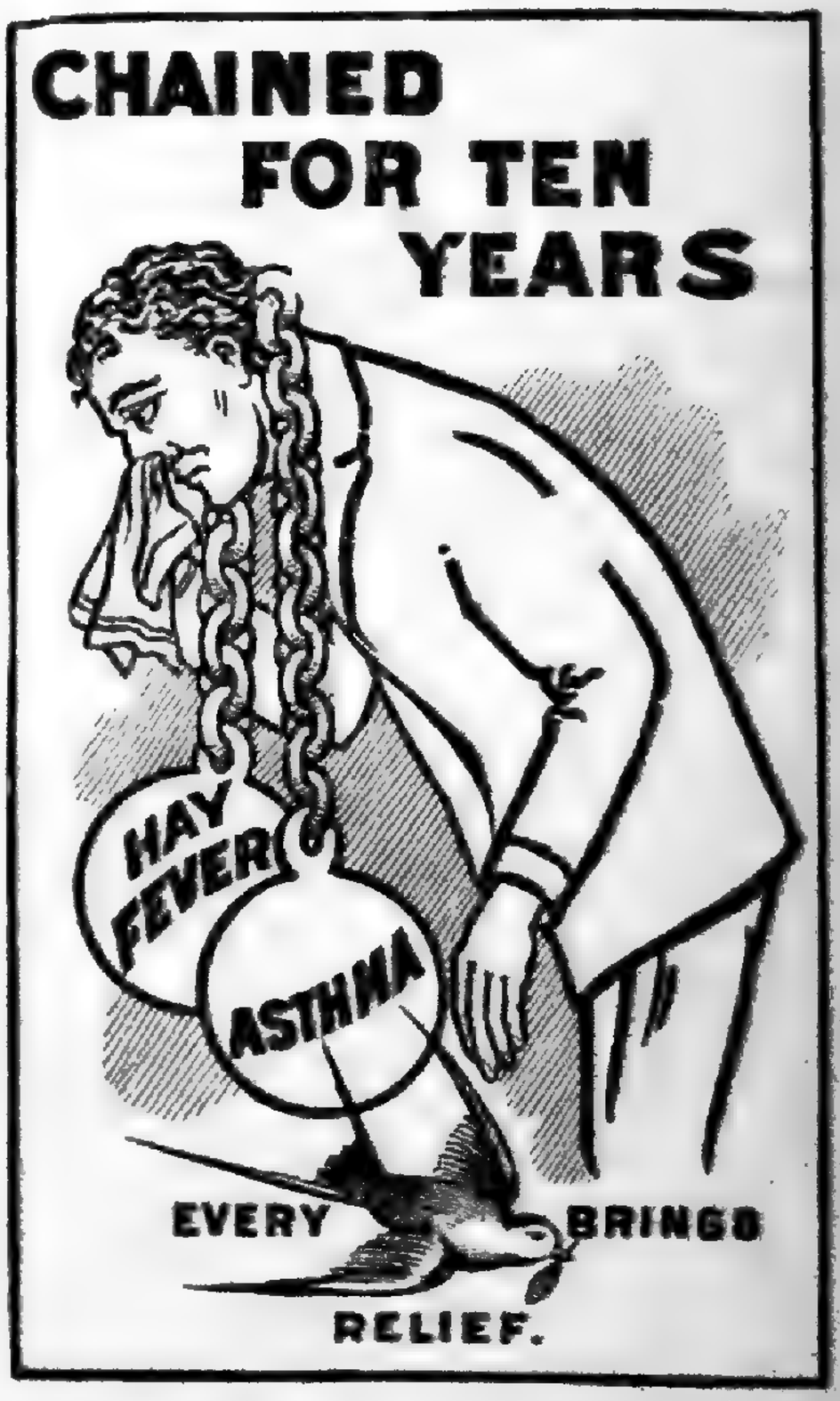
Gentlemen: Your Asthmalene is an excellent remedy for Asthma and Hay Fever, and its composition alleviates all troubles which combine with Asthma Its success is astonishing and wonderful.

After having it carefully analyzed, we can state that Asthmalene contains no opium, morphine, chloroform or ether.

Very truly yours, REV. DR. MORRIS WECHSLER.



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Gentlemen: I was troubled with Asthma for 22 years I have tried numerous remedies, but they have all failed. I ran across your advertisement and started with a trial bottle. I found relief at once. I have since purchased your full-size bottle, and I am ever grateful. I have a family of 4 children, and for 5 years was unable to work I am now in the best of health and am doing business every day. This testimony you can make such use of as you see fit.

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COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.

Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphytite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore arrage 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at $6 per ton on small shipments; smelting charges $6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at $13.

A 7 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 30 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to $3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for $2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of $1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, $50,000; six months' developing bond; shipping privileges.

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Lakeside, San Diego county, California.

This Hotel is a convenient place to stop on the way to and from the mines.

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The West American Scientist.

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BIOGRAPHICAL.

BIRTWELL, FRANCIS J.:
Well and favorably known to ornithologists as a writer on the birds of New Mexico, ascended a lofty pine tree to procure a birds' nest, 29 Je 1901, became entangled in the rope and strangled in the presence of his bride.

DEAN, GEORGE W.:
Born in Ohio 20 Ag. 1820, died 19 Ap 1901. A successful nurseryman and florist, well known to many as an ardent collector of shells.

COODE, GEORGE BROWN:
Part 2 of the report of the U. S. National Museum for 1897 is a memorial of this eminent naturalist, together with a selection of his papers on museums and on the history of science in America. Portraits of the earlier scientific men, and notice of their work in connection with "the origin of the national scientific and educational institutons of the United States," and "the beginnings of natural history in America," form a volume of great interest, and a worthy monument to one who was great as a man and as a scientist. A list of his published writings occupy 20 pages of the memorial.

Le CONTE, JOSEPH:
One of the most eminent scientists, of the University of California, died July 6, 1901.

He was of Huguenot descent, and was born in Liberty county, Georgia, 26 F 1823. As a teacher he was suggestive, interesting and inspiring, and his naturally kind and genial disposition gained him the affection of his pupils. Geology, optics, aerostatics and physiology were branches upon which he became authority.

Among his important writings are:
—Religion and science.
—Elements of geology.
—Evolution and its relation to religious thought.
—Sight, or the principles of monocular and binocular vision.
—Outlines of the comparative physiology and morphology of men and animals.

LINTNER, JOSEPH ALBERT:
Bulletin Vol. 5, No. 24 of the N. Y. State Museum, is a "memorial of life and entomologic work" of this prominent entomologist, by Ephraim Porter Felt, with portrait.

WEST AMERICAN MOLLUSCA.

STEARNS, ROBT. EDWARDS CARTER —Exotic mollusca in California. Science, 27 Ap 1900.

Notes the occurrence of the following species:

AMALIA HEWSTONI Cooper.
Seattle, Washington, to San Diego, California.

BULIMULUS VENTROSUS Fer.
Oakland, California (Henry Hemphill).

COCHLICOPA LUBRICA Muell.
Ferussacia subcylindrica L.
Grizzly Peak, Berkeley, Cal. (H. Hemphill); Oregon; Alaska.

CREPIDULA CONVEXA Say.
Variety GLAUCA Say.
This form of the Atlantic slipper-shell was found on the Alameda flats, Cal. by Henry Hemphill.

HELICODISCUS LINEATUS Say.
Oakland, California (Henry Hemphill).

HELIX ASPERSA Muell.

MODIOLA PLICATULA Lam.
Nova Scotia to Georgia. Found in 1894 three miles north of Stanford University, Cal., by N. F. Drake.

MYA ARENARIA Linn.
Mya Hemphillii Newcomb.
San Francisco bay, Cal. (Henry Hemphill, N 1874). Washington. Accidentally introduced on the Pacific coast, from the Atlantic seaboard, and variously known as the "soft-shelled," "squirt," "long-necked" clam, and "mananose." An important food species.

OSTREA VIRGINICA Gmelin.
Importations of seed oysters from the Atlantic side to San Francisco bay, California, for the nine years ending with 1896 amounted to 15,271,000 pounds, costing $350,000.00, according to the U. S. Fish Comm. report for 1896.

UROSALPINX CINEREUS Say.
The oyster-drill of the Atlantic coast, discovered on the oyster beds in San Francisco bay, California, by C. H. Townsend, in 1889.

ZONITES CELLARIA Muell.

ZONITES DRAPARNALDI Beck.
Greenhouses, Seattle, Washington; Oakland, California.

STEARNS, R. E. C.
—The edible clams of the Pacific coast and a proposed method of transplanting them to the Atlantic coast. U. S. Fish Com b 3:353-362.

Mentions the following:

CARDIUM CORBIS Mart.
Cockle.

GLYCIMERIS GENEROSA Gould.
Puget Sound to San Diego, California. "Geoduck," attaining a weight of 16 pounds (fide Capt. J. S. Lawson)!

MYTILUS EDULIS Linn.

SAXIDOMUS NUTTALLII Conr.
Saxidomus aratus Gould.
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Saxidomus brevisiphonatus Cpr.
Sitka to San Diego, California. Fully equal, if not superior, as many persons think, to the Atlantic quahaug.

SCHIZOTHAERUS NUTTALLII Conrad
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Puget Sound to San Diego, California. Closely approaching the best oysters in tenderness and delicacy.

TAPES STAMINEA Conr.
"Little round clam," or "hard shelled."

ACTAEON TRASKII Stearns.
Shell small, conical above, cylindrical, rather solid, opaque, somewhat glossy; sculpture consisting of fine spiral impressed lines or grooves which become wider toward the base of the body whorl, making the sculpture of the lower portion of the shell lirate; part of the lirae are slightly grooved and in some cases show a tendency to run in pairs; the grooved lines are not quite regular in their relative distances, and some are deeper than others; the surface is otherwise sculptured by sharp, close-set, incremental lines; these latter are subordinate to the spiral sculpture and are more conspicuous on the lower part of the body whorl. Color dull-cream white, with (in the example before me) 2 obscure, broad, pale rufous bands on the body whorl. Spire short, obtusely conical. Whorls 6 (probably, apex in example somewhat eroded); suture distinct, narrowly channeled. Aperture about two-thirds the length of the shell (not quite 9 mm), acutely angular above, rounded and effuse below, finely lirate and glossy within, with a thin glazing on the body whorl. Outer lip thin, simple. Columella short and flexuous, with a conspicuous fold, curving around the same and thickening the edge of the lip, which is moderately produced in the umbilical region. Length of shell (type), 21, of body whorl 19, breadth 12 mm."—Stearns, U S Na Mu pr 21: 297-298. f (1899).

Quaternary marl: San Diego, California (Stearns, Homer Hamlin).

ACTAEON PUNCTOCAELATUS, Cpr.
Stearns, U S Na Mu pr 21: 297, 299 (1899):—quaternary, San Diego, Calif.

Va. CORONADOENSIS Stearns.
Stearns, U S Na Mu pr 21: 299 (1899).
Slender, more attenuated and delicate than the recent specimens, without the dark bands. Quarternary marl, Spanish Bight, San Diego, California (Stearns).

SUCCINEA CINGULATA Forbes.
Oblong-ovate, slightly oblique, striate, shining; spire well developed, suture impressed; whorls 4; aperture large, oval; columella at the base receding to the left. Brownish-yellow, with obsolete spiral white lines. Length 12, diameter 6 mm. Mazatlan, Mexico?
Tryon, Monog T M 28, t 2 f 35.

SUCCINEA CHRYSIS Westol.
Living: Andreafski, Yukon river, Alaska.

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MINES.

CLEVELAND COPPER GROUP.

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphyrite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at $6 per ton on small shipments; smelting charges $6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at $13.

A 2 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 20 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold $ to $3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine oak and juniper wood for all purposes on the ground. Wood can be purchased for $2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of $1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, $50,000; six months' developing bond; shipping privileges.

UTTER, GEORGE H.:
Silver City, New Mexico.

MOHAVE DESERT IRON MINES.

In May, 1892, the writer first visited the region known as the Mohave desert, in San Bernardino county, California, and found it to be in fact a delightful garden, filled with a great variety of brilliantly colored flowers. The usually leafless and thorny shrubs were in full of deep indigo flowers, while every place displayed a bed of delicate blossoms unknown to more favored localities.

The mountains on either hand of the valley were still covered partially with snow, darkened with the masses of evergreen—spruce, cedar and pine, which render these peaks a delight in summer to the pleasure seeker.

The tree yucca, the wild datile, and large specimens of cactus, growing over the high part of these slopes, render the name desert somewhat of a misnomer; as one leaves the base of the mountains however, large areas of valley and low rolling country—from a botanical standpoint—are met with, but little wealth of its minerals will be found in a telegraphic character.

Forty or 50 miles due south from a point midway between Newberry and Daggett stations, 235 miles from San Francisco, and 100 miles from Los Angeles, which by the Santa Fe route, occupies probably the largest deposit of iron ores on the Pacific Coast. It is conservatively estimated by conservative men that fifty to one hundred million tons of magnetic and hematite ores lie above and convenient to a suitable railway grade, which can be quarried without mining—if we restrict the word mining to the English sense of underground workings.

The writer is indebted to Mr. H. C. Hamilton, of San Diego, Cal., one of the owners in this vast property, for many of the facts here presented concerning the Bessemer Iron District the 320 acres of patented lands covering the more valuable and accessible portions of this remarkable body of ores.

The chief chemist of the U. S. Geological Survey, after an examination of the magnetite, says: "A very high grade of magnetic ore with but a trace of titanium."

Prof. Pierce de P. Ricketts, the well known ex-chief of the school of mines and metallurgy, of Columbia College, New York, secured the following results from an examination made for the following elements only: Metalic iron, 68.48; Manganese, .038; Sulphur, .076; Titanium, .02; Phosphorus, (trace) per centum.

Prof. Woulfe, chemist of the Union Iron Works, San Francisco, Cal., secured the following results from a car load each of the Magnetite (M) and Hematite (H): Sesqui oxide of iron, M 95.8, H 81.94; Proto oxide of iron, M 25.5, H 8.25; Alumina, M 2.843, H 3.24; Manganese oxide, M .52, H .43; Lime, M .72, H .82; Magnesia, M 3.83, H 3.18; Phosphorus anhydride, M .013, H .066; Sulphur, M .038, H .47; Silica, M .845, H .061 per centum.

Samples of surface ores from all the workings, aggregating 50 lbs., gave: Iron, 66.25; Silica, 1.65; Lime, 1.35; Magnesia, 3.32; Sulphur, .031; Phosphoric acid, .554; Tatanic acid, 0; Alumina, .84; Manganese, .25; Iron peroxide, 72.21; Iron proto oxide, 20.15; Manganese oxide, .39; and Phosphorus, .024 per cent. (analysis by Mr. Curry, of Pittsburg, Pa).

There is an abundance of good water at the junction of a proposed railway to the mines with the Santa Fe, and a good supply can probably be developed on or near the property. A uniform grade of ore (not to exceed three per cent., with no cuts, fills or expensive bridging) makes a connection with the existing railroads comparatively easy of accomplishment. The cost of mining the ore is estimated not to exceed 50 cents per ton f. o. b., and freight to tide water, $3 per ton. Fuel and timber can be obtained in large quantities from the mountains in sight, estimated to be about 8 miles away.

The 9th and 11th reports of the California state mineralogist give very able and conservative estimates of the quantity and quality of the ore bodies.

The recent discovery of oil at Victor, on the Mohave desert, should hasten the development of our latent iron industries, which have lain dormant for an abnormal period, owing in part to the death of one of the owners in these iron lands.

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Just a hope to gild the way,
Just a word to speak of Jesus,
Do you love Him as you may?

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The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranchos in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection: 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 3,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

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Price 10c a copy, $1 a year, $10 for life.
Charles Russell Orcutt, Editor,
Number 265 Twenty-first Street,
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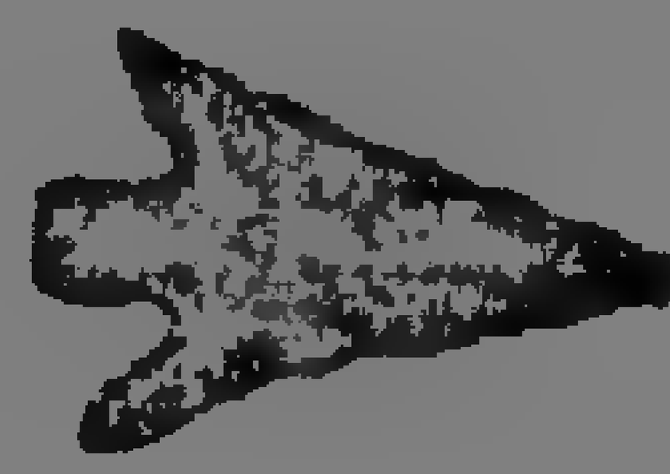

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The West American Scientist.

Vol. XII. No. 5. *October, 1901.* *Whole No. 106.*

Established 1884.
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Published monthly.
Price 10c a copy; $1 a year; $10 for life.
Charles Russell Orcutt, Editor,
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Our direct aim is a review of our present knowledge, and a record of new discoveries, in natural history and other branches of science. Descriptions of animals and plants, not easily accessible to the young student, notes of economic or geographic significance, bibliography, synonymy, and an interchange of ideas, will be means used to a common end.

The reader must assist the editor in carrying out the great work undertaken, if the greatest results are to be achieved. The management of the journal exists to serve the reader—in identifying minerals, plants and animals, in supplying needed literature, as a medium of communication and record, or in any way that may tend to promote human intelligence, which in its greatest development leads to an affinity with God.

ABREVIATIONS.

aes—Agricultural experiment station
agr—agrostology (Division of)
Am—America, American.
an—annual.
anth—anthropology, anthropological
b—bulletin.
cir—circular.
D-A—U. S. Department of Agriculture
f—Figure.
FCM—Field Columbian Museum.
pr—proceedings.
r—report.
sc—society.
sr—Series.
U—university.
Zo—Zoology, zoological.

AUTHORS' LIST.

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—See M. E. Jaffa.
BEANE, HAL H.:
—Some Idaho soils. U of Idaho aes b 28.
DORSEY, GEORGE A.:
—Archaelogical investigations on the

island of La Plata, Ecuador. FCM anth sr 2: 247-280, t 43-102.
—et H. R. Voth: The Oraibi Soyal ceremony. FCM anth sr 3: 1-59, t 1-37.
EATON, ELON HOWARD:
—Birds of Western New York. Rochester ac pr 4: 1-61. F 1901.
ELLIOT, D. G.:
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South side of Cuyamaca peak, San Diego county, California.

BROMUS MAXIMUS Desf.

Type from northern Africa. Stanford University (C. Ritter 305), California.

Var. GUSSONI Parl.

Bromus gussoni Parl Rar. Pl. Sic. 2: 5 (1842).

Bromus sterilis Gus Fl. Sic. Prod. Suppl. 1: 27 (1832).

Larger than the type, 4-7 dm. tall, larger and more lax panicle, 1-2 dm. long, with the upper part somewhat drooping.

Arizona, California. Washington. Introduced. San Diego, California (Orcutt 1059).

CHAELOCHLOA GLAUCA Scribn.

Setaria glauca Beauv Agrost 51 (1812).

Panicum glaucum L. sp. Pl 86 (1753).

Chamaeraphis glauca Kuntze Rev. Gen. Pl. 2: 767 (1891).

Ixophorus glaucus Nash Torr bot. club. 22:423 (1895).

BROMUS UNIOLOIDES HBK.

Annual, or sometimes perennial, 3-4 ft. high, several stems from same base; panicle large and spreading, spikelets about 1 inch long, ¼ wide, composed of 5-7 florets overlapping each other; flowering glumes coarse in texture, strongly nerved, usually bearing a short awn about 3 mm. long. Rescue grass. Widely distributed in South and Central America, Mexico, Southern Texas, and naturalized or cultivated in the southern United States; Europe, and Australia. Known also by the names Iverson's, California prairie, Schrader's brome, and meadow grass, Australian oats, etc.

Spec. cir 26 agr D-A. f.

BROMUS HORDEACEUS L.

Bromus mollis L. Sp pl ed 2, 1:112 (1762).

Serrafalcus mollis Parl Fl Ital 1:356 (1848).

Erect or ascending annual or biennial with a rather dense, erect panicle; culms about 2-8 dm high, usually somewhat pubescent at the nodes; sheaths retrorsely soft pilose-pubescent; ligule 1.5-2 mm. long, laciniate; blades linear, pilose-pubescent to nearly smooth, about 5-15 cm long and 3-5 mm broad; panicle contracted, narrow pyramidal, 5-10 cm long, 2-4 broad; branches somewhat spreading in flower; spikelets 5-13 flowered, ovate-lanceolate, becoming obtuse, 12-15 mm long, 4-6 wide, with short pedicels; empty glumes broad, obtuse, coarsely pilose or scabrous-pubescent, the lower 3-5-nerved, 4-6 mm long, the upper 5-7-nerved, 7-8 mm long; flowering glume broad, obtuse, 7-nerved, coarsely pilose or scabrous-pubescent, rather deeply bidentate, margin and apex hyaline, 8-9 mm long; awn rather stout, rough, flattened toward the base, straight at first, frequently somewhat twisted when old, about 6-8 mm long; palea a little more than ¾ the length of its glume.

Southern Europe; introduced sparingly from Maine to Virginia, abundantly on the Pacific coast, from Washington, to Los Angeles, California.

BROMUS TRINII Desv.

Trisetum hirtum Trin Linnaea 10:308 (1835).

Trisetum barbatum Steud Syn Pl Gram 229 (1854).

Bromus barbatoides Beal Grass N A 2:611 (1896).

California; Colorado; Chili.

Var. PALLIDIFLORUS Desv.

Bromus barbatoides sulcatus Beal grass N A 2:615 (1896).

Trisetum barbatum major Vasey in herb Beal Grass N. A. 2:615 (1896).

Robust, 6-12 dm high, panicle much elongated, 2-4 dm long; branches mostly 6-12 at the lower whorls, weak and spreading; leaves broadly linear lanceolate, smooth or somewhat sparsely pilose-pubescent, as are the sheaths.

Type from the Andes of southern Chili. Cholias valley, San Diego (Orcutt 1064), Pasadena (C. D. Allen, in 1885), and San Nicolas Island (Balnche Trask 15), California.

PLANTAGO PICTA Morris.

Utah, Arizona, Southern California (Parish 2643).

PLANTAGO OBLONGA Morris.

Colorado Desert, California (Orcutt).

PLANTAGO IGNOTA Morris.

Ft. Verde, Arizona (E. A. Mearns 194), northern Baja California.

PLANTAGO SPECIOSA Morris.

Santa Catalina Island, California (C. B. Grant 2412).

PLANTAGO OBVERSA Morris.

Del Mar, San Diego County, California (Belle Summer Angier 21).

Plantago erecta Morris in part; Torr bot. cl b. 27:118 (1900).

PLANTAGO ERECTA Morris.

Plantago patagonica Californica Greene Man bay reg. 235 (1884).

California; Oregon.

MOHAVE DESERT IRON MINES.

In May, 1882, the writer first visited the region known as the Mohave desert, in San Bernardino county, California, and found it to be in fact a delightful garden, filled with a great variety of brilliantly colored flowers. The usually leafless and thorny shrubs were a mass of deep indigo flowers, while each open space displayed a bed of delicate annuals unknown to more favored localities.

The mountains on either hand of the Cajon Pass were still covered partially with snow, darkened with the masses of evergreen—spruce, cedar and pine, which render these peaks a delight in summer to the pleasure seeker.

The true yucca, the wild datile, and large quantities of juniper, growing over a large part of these slopes, render the name desert somewhat of a misnomer: as one leaves the base of the mountains, however, large areas of very uninteresting country—from a horticultural standpoint—are met with, but the wealth of its minerals will be found a redeeming character.

About 16 miles due south from a point midway between Newberry and Hazlitt stations, 275 miles from San Diego, Cal., and 180 miles from Los Angeles, Cal., by the Santa Fe route, occurs probably the largest deposit of iron ores on the Pacific Coast. It is variously estimated by conservative men that fifty to one hundred million tons of magnetic and hematite ores lie above and convenient to a suitable railway grade, which can be quarried rather than mined—if we restrict the word mining to the English sense of underground workings.

The writer is indebted to Mr. H. C. Gordan, of San Diego, Cal., one of the owners in this vast property, for many of the facts here presented concerning the Bessemer Iron District, the 320 acres of patented lands covering the more valuable and accessible portions of this remarkable body of ores.

The chief chemist of the U. S. Geological Survey, after an examination of the magnetite, says. "A very high grade of magnetic ore with but a trace of titanium."

Prof. Pierce de P. Ricketts, the well known ex-chief of the school of mines and metallurgy, of Columbia College, New York, secured the following results from an examination made for the following elements only: Metalic iron, 68.48; Manganese, .038; Sulphur, .073; Titanium, .02; Phosphorus, (trace) per centum.

Prof. Woulfe, chemist of the Union Iron Works, San Francisco, Cal., secured the following results from a car load each of the Magnetite (M) and Hematite (H): Sesqui oxide of iron, M 68.8, H 81.14; Proto oxide of iron, M 25.5, H 7.28; Alumina, M 2.813, H 3.24; Manganese oxide, M .52, H .43; Lime, M .72, H .82; Magnesia, M 3.83, H 3.18; Phosphorus anhydride, M .013, H .066; Sulphur, M .038, H .47; Silica, M .845, H .061 per centum.

Samples of surface ores from all the workings, aggregating 50 lbs., gave Iron, 66.25; Silica, 1.65; Lime, 1.35; Magnesia, 3.32; Sulphur, .031; Phosphoric acid, .551; Tatanic acid, 0; Alumina, .84; Manganese, .25; Iron peroxide, 72.21; Iron proto oxide, 20.16; Manganese oxide, .39; and Phosphorus, .024 per cent (analysis by Mr. Curry, of Pittsburg, Pa).

There is an abundance of good water at the junction of a proposed railway to the mines with the Santa Fe, and a good supply can probably be developed on or near the property. A uniform grade of one (not to exceed three) per cent., with no cuts, fills or expensive bridging makes a connection with the existing railroads comparatively easy of accomplishment. The cost of mining the ore is estimated not to exceed 50 cents per ton f. o. b., and freight to tide water, $2 per ton. Fuel and timber can be obtained in large quantities from the mountains in sight, estimated to be about 8 miles away.

The 9th and 11th reports of the California state mineralogist give very able and conservative estimates of the quantity and quality of the ore bodies.

The recent discovery of oil at Victor, on the Mohave desert, should hasten the development of our latent iron industries, which have lain dormant for an abnormal period, owing in part to the death of one of the owners in these iron lands.

C. R. ORCUTT.

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CLEVELAND COPPER GROUP.

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,523 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,700 feet. Altitude of Silver City, 6,000 feet.
Good roads from Silver City to the mines.
Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.
Porphyritic-syenite hanging and foot walls with quartzite, porphyry, syenite, dolomite (lime), porphytite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 2 to 150 feet each, iron capped and lie flat as quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.
Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjacent dolomite wall. Shipments of ore running 8 to 13 per cent. copper, iron and silica neutral.
Ore can be marketed at the Silver City reduction works.
Cost of mining, assaying and hauling to Silver City estimated at $5 per ton on small shipments; smelting charges $6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.
Net profit per ton (on a 10 per cent. ore) estimated at $13.
A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.
This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.
The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 31 to 49 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.
Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to $3 per ton.
Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.
A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.
Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for $3 per cord.
This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of $1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.
Price, $50,000; six months' developing bond; shipping privileges.
UTTER, GEORGE H.:
Silver City, New Mexico.

THE WEST AMERICAN MINING AND EXPLORATION ASSOCIATION.

San Diego, California.

The objects of this association are to further the systematic and scientific exploration of West America, and to foster and promote in every legitimate manner the various branches of the mineral industries. There are hundreds of undeveloped mineral properties in the western United States and Mexico containing gold, silver, copper, iron, lead, and other metals or valuable minerals, waiting for some one

with capital and business judgment to turn them into paying mines. No investment yields better returns than a good mine. But there are thousands of alleged mines or prospects, and many fortunes have been spent on worthless claims, while valuable properties are often ignored for years, until chance or education reveals their value.

There are few mines for the poor man. It takes money to operate on a scale commensurate with the business involved. It is a common saying that "mines are made, not found." Ignorance and insufficient means, are the two rocks upon which many mining enterprises have been wrecked.

Many valuable claims can be bought for a small sum. Often the controlling interest can be obtained without other consideration than an agreement to do a certain amount of development work, sufficient to demonstrate the value of the property. Conditions are now favorable for working many mines, abandoned years ago, when facilities for transportation, or for the treatment of certain classes of ore, did not exist.

The association is formed to "prospect for prospects"—to secure an exhaustive investigation and conservative reports upon mines and mineral lands, and to locate, purchase, or otherwise acquire such as prove of value, and to develope, operate and sell; also to buy and sell real estate, to buy, sell and deal in minerals, gems, rocks, ores and metals, and general merchandise, when found desirable, to erect smelters, mills and factories, and to engage in other business that may further its aims.

The success of the enterprise depends greatly upon the ability, judgment and honesty of the managers—points of vital interest to the intending investor. Economical, intelligent, honest effort will win success. No offers of "a sure thing", no big promises of things uncertain of accomplishment, will mar the simple statement of faith in legitimate mining as a business. Hundreds of claims may be examined before one of true worth is found, but a single success will abundantly reimburse the association for many failures. By keeping in touch with the mineral industries in Europe and America, and employing the services of specialists of known reputation, the expensive experiences and failures due to ignorance should be avoided.

A capital stock of half a million shares, of the par value of $1.00 each, sold only at par, and the proceeds applied in an economical manner wholly in furtherance of these plans, should place the association on a firm financial basis.

Subscriptions of from one to one hundred dollars per month are invited, to terminate whenever the assessed value of the property of the association shall equal its capital stock, all unsold shares to be then withdrawn from sale. All stock will thus be fully paid and nonassessable.

It is the desire of the association to keep in close touch with prospectors and discoverers of valuable mineral deposits. It is not the intention to employ or "grub stake" prospectors, or to purchase with stock properties of unknown value at fictitious prices. The aim instead is to facilitate the development and utilization of properties of merit. Thus it is hoped to earn an interest in valuable mines, or acquire by purchase at moderate cost, properties that from a lack of means or a limited knowledge, might otherwise remain untouched. The association will also act as brokers for the owners of developed mines. In this way the interests of the prospector, the mine owner, and the investor, may be best efficiently served.

Subscriptions will be received by the following agencies:—
Wm. H. Holcomb, County Clerk.
Blochman Banking Company.
First National Bank of San Diego.
C. R. Orcutt, editor West Am. Scientist.
Eugene E. Shaffer, County Auditor.
Ira J. Gray, Book Exchange, 1641 F str
Ernest Schernikow, 18 Broadway, N. Y

METALS AND ORES.

ANTIMONY—An ore carrying about 38 to 40 per cent of this metal, and from

$30 per ton in gold, occurs near San Diego, and awaits development.

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

LITHIUM.—Amblygonite, lepidolite, spodumene, and triphylite are the principal ores of this rare metal, the lightest known.

PLATINUM.—The constantly increasing demand for this widely distributed metal in the arts and manufactures of the world, and the present limited sources of supply, have in recent years greatly enhanced its price; about 80 per cent. of the present supply is derived from the alluvial deposits of the Ural mountains, but there are few if any of the gold-bearing gravel beds of the world that have failed to yield this metal. Platinum ore is usually found in the form of rounded or flattened grain or 'sand," occasionally in irregular lumps of the size of peas; large nuggets are very rare—the largest as yet found weighing 21 pounds. The largest ever found in America weighed nearly 2 pounds.

QUICKSILVER.—Cinnabar is the principal ore.

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

REAL ESTATE.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection; 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 2,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bottom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for $2,500.00 a year—optional with purchaser to take possession in 30 days. Price $8.00 an acre.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

Six square leagues (26,628 acres) of fertile land, with creeks of running water and perennial springs, an old adobe house, and primeval orchard of olives, oranges, lemons, figs and grapes, situated in Mexico, about 20 miles south and east of San Diego City, California, is an estate that might well captivate the fancy of any eastern home seeker.

One-third of the land is adapted to cultivation, the balance grazing land. Quartz and placer gold mines, mineral water, abundant wood, and a perfect climate, are among the attractions.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

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108 Main St., Andover, Mass.

COINS.

Wanted—One peso of Paruguay.
5 frs os Helvetia.
ORCUTT, San Diego, California.

SHELLS.

JAPANESE LAND SHELLS.

Helix mackenzii Val. K oto
japonica Pfr.
luhuana Sby
pelionphala Pfr
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

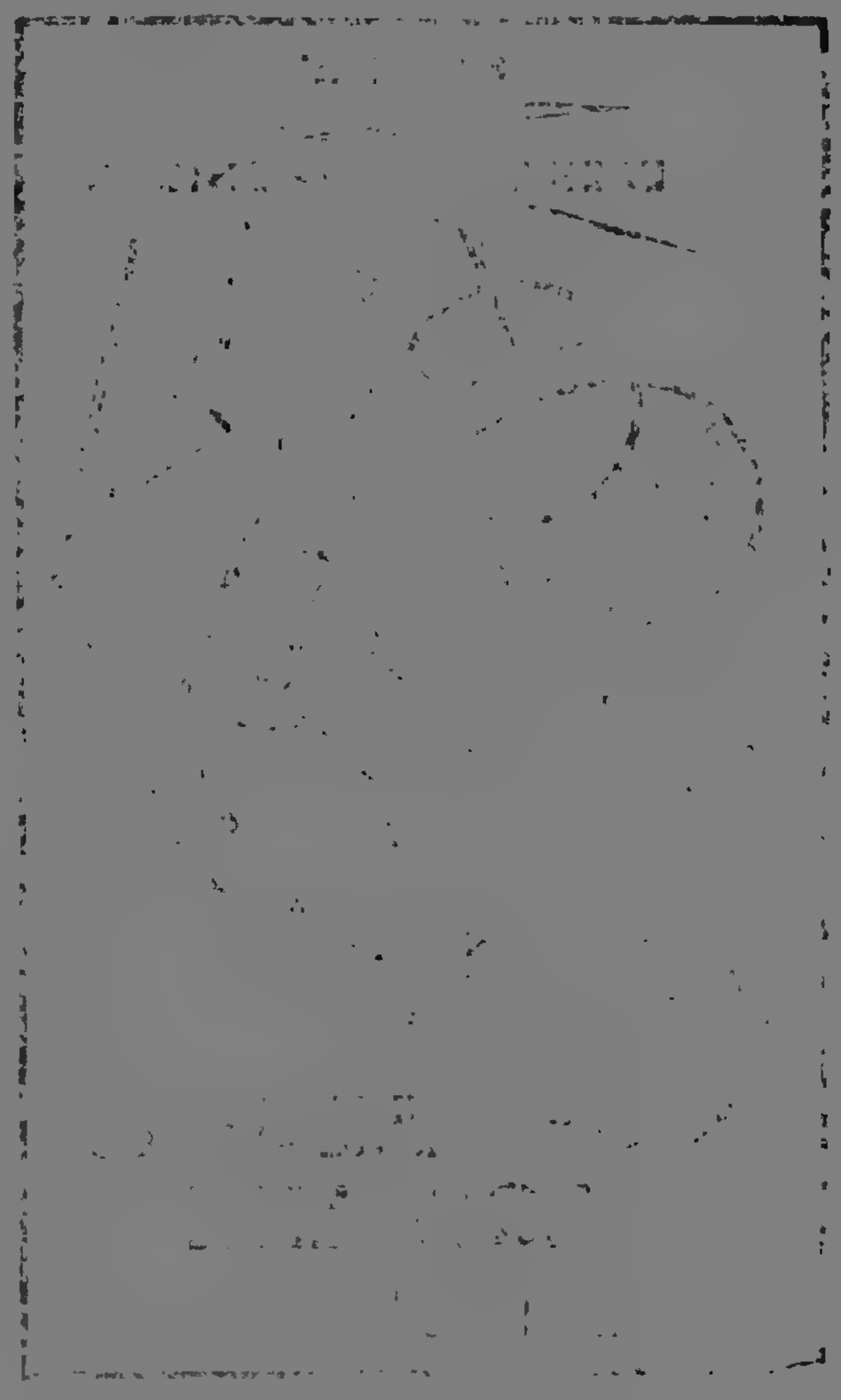
Shells to exchange for shells.

Prices are for single specimens in good condition—slightly imperfect at ½ price.

Exchanges for books, magazines, etc.

Acmaea asmi	05
depicta	10
insessa	10
mesaleuca	10
mitra	10
paleacea	10
patina & v cumingi	10
pelta & persona	05
scabra & v limatula	05
spectrum	05
Alexia myosotis setifer	05
Alycæus longituba Mts	40
jagori Webr	60
Amiantis callosa	30
Amnicola dupotetiana, limosa	05
longinqua, paluda, protea	05
Amphidromus palaceus	80
semirugosus Bttgr	50
Ampullaria cumingii Sby	75
Anchidra porcellanus Mouss	30
Anculosa rubiginosa	05
Ancylus deperditus, fluviatilis, lacustris, paralelus, rivularis	05
Anodonta edentula 10, ferrusacina, undulata	05
Arca americana 20, incongrua 10, occidentalis 15, pexata	10
Auricula elongata 20, midae	1 00
Barleeia subtenuis	05
Bittium nigrum Totten	04

Buccinium glaciale..... 20
Bulimus lubricus..... 03
Bulinus hypnorum..... 05
Busycon perversum..... 15
Bythinela binneyi, intermedia..... 05
Bythinia tentaculata 05
Callopoma tesseliatum Reeve..... 25
Cardita affinis Brod..... 35
Cerithium muscarum Gmel..... 10
Chiton dentiens Gould..... .. 10
Hartwegii Cpr. 10
ciliata Sby. (muscosa Gould)..... 25
lanuginosus Cpr..... 25
conspicua Cpr..... 20
pectinulatus Cpr..... 15
scabra Reeve..... 15
Clausilia junghuhni Phil..... 30
javana v. planispira Bttgr..... 30
Conohelix conicus Schum..... 50
Conus abbreviatus..... 20
eburneus Brug..... 30
imperialis L..... 1 50
marmoreus L..... 50
proteus Hwass 50
Crepidula unguiformis Say..... 05
Cycas achatinaceum Pfr..... 40
Cypræa helvola L..... 15
caurica L 30
rotunda Kiener..... 30
moneta; 'African money' 05
Sowerbyi Kiener 1 00
Diplomatina auriculata Bttgr..... 60
Dosinia ponderosa Gray... 40
Engina carbonaria Reeve..... 20
Georissa javana Bttgr 80
Helix rosatoria..... 30
leucomphala Bttgr..... 30
subsimilaris Nts..... 30
semernensis Mouss..... 40
Hemicardium unedo L..... 60
Hemiplecta centralis Mouss 80
Hypsclostoma Fruhstorferi Bttgr. 40
Kadiella ambia, indiferus, convexoconica, viritula Bttgr. each 20
Lagochilus grandipilum Bttgr..... 25
Limnæus javanicus v. teuggerious v. ventrosa W..... 20
Limnæa adelinæ Tryon 15
Littorina Philippii Cpr..... 20
Lottia gigantea Gray..... 15
Macoma nasuta Conr 30
Macron Kellettii Forbes..... 50
Murex pomum Gmel..... 10
adustus Lam..... 25
bicolor..... 25
brevifrons..... 15
plicatus Sby 30
Mytilus pellucidus..... .. 10
Nacella depicta &c.—see Acmæa.
Nassa luteostoma B. & S..... ... 25
Natica bifasciata Gray..... 10
Pritchardii Fbs..... 30
uber Val..... 20
Nerita Bernhardi Recl..... 15
Neritina diadema Real..... 20
tessellata Law. v. maculifera Mouss 20
Neritina picta..... 10
reclivata Say..... 05
viridis Lam..... 10
Norrisia Norrisi Sby..... 25
Nitidella cribraria Lam..... 20
Oliva venulata Lam..... 10
Olivella anazora Duclos..... .. 15
bellula 20
dama Mawe..... 10
gracilis Gray..... 20
tergina Duclos..... 10
zonalis Lam..... 10
oryza Lam..... 05
mutica Say..... 05
Omphalius ligulatus Menke..... 15
Opeas achatinaceum Pir..... 30
Patella magellanica..... 25
viridula Lam..... 20
variabilis Sby..... 20
Planaxis lineolatus Gld..... 20
planicostata Sby..... 20
nigritella Fbs..... 20
lineatus Da Costa..... 20
Planorbis compressus Shutt..... 20
Pleurotoma olivacea Sby 50
Prosopeas acutissimum Mouss..... 30
Protinula violacea King..... 40
Psammobia rubroradiata Conr..... 75
vespertina Chemn..... 10
Pupina bipalatalis Bttgr..... 20
succinaces..... 20



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WEST AMERICAN MOLLUSCA.

COCHLICOPA LUBRICA Muell.

Ferrussacia subcylindrica L.

Grizzly Peak, Berkeley, Cal. (H. Hemphill); Oregon; Alaska.

COCHLIOPA ROWELLII Tryon.

Shell depressed, wider than high, whorls 3½, regularly convex, rapidly enlarging; spire small, slightly elevated, apex acute, sutures well marked; base convex, except that region around umbilicus is flattened and inclined toward the axis, its outer boundary marked thus by an angle; umbilicus small, very distinct; aperture half ovate, labrum well rounded, thin, labium slightly rounded, thickened, elevated from body whorl forming an acute angle with the labrum above, and not impinging on the umbilicus. Color yellowish-green. Operculum paucispiral. Height 2½, larger diameter 4, smaller 3 mm.

Living: Clear lake, California? Panama?

MELAMPUS OLIVACEUS Cpr.

Obconic; spire short, suture indistinct; whorls 7-9, obtusely angulated on the body below the suture; aperture long and narrow, lip covered with sharp laminae within, parietal wall with from 1 to 3 small revolving laminae; there is also a stout fold on the columella. Epidermis olivaceous, below which the color is white with patches or revolving lines of red. Length 13, diameter 8 mm.

Living: San Diego, California to Mazatlan.

PEDIPES LIRATA, W. G. Binney.

Shell globosely conical, solid, with regular spiral lines; spire short, with obtuse apex; whorls 3, the upper ones small, the last equalling five-sixths of the total length; aperture semicircular; parietal wall with strong transverse lamina, columella with 2 acute approximate teeth. White or yellowish. Length 3.3, diameter 2.5 mm.

Living: San Diego, California (Orcutt). Cape San Lucas, Baja California.

SCALA STEARNSII Dall.

Pliocene: Pacific Beach, San Diego, Calif. (Stearns, 1887).

Stearns, Wagner Free Inst tr III, pt 2:245 t 21 f 4 (1892).

SELENITES CAELATA Mazyck.

Shell small, depressed, brownish horn-color, with very coarse, rough, crowded, subsequidistant, irregular ribs, which are obsolete at the apex; whorls 4, rounded, somewhat inflated below, gradually increasing, the last not descending at the aperture; suture impressed; umbilicus wide, clearly exhibiting all the volutions; aperture almost circular, slightly oblique; peristome simple, its ends approaching and joined by a very thin, transparent, whitish callus, through which the ribs are distinctly seen. Greater diameter 4, height 1.75 mm. Santa Barbara (Dr. L. G. Yates); Hayward's, Alameda county, California (W. H. Dall).

Mazyck, U S Na Mu pr 9:460-461, f 1886.

SELENITES DURANTI.

Mazyck, U S Na Mu pr 9:460-1 f (1886).

Helix duranti Newcomb, Ca ac pr 3:113 (1861).

Patula duranti Tyron, Am J Conch 2:262, t 4 f 53 (1866). Mong. T. M. 51, t 4 f 53.

Hyalina duranti Binney and Bland L-F S 1:37, f 49 (1869).

Macrocyclis duranti W G Binn T M 5:94, 188. Man Am L S 85 f 49 (1885).

"Shell depressed, discoidal, pale corneous, under the lens minutely striated, opaque, broadly and perspectively umbilicated; whorls 4, the last shelving but not descending (at the apeture); suture linear; aperture rounded, lunate, lip simple, the external and internal approaching. Santa Barbara Island."—Newcomb.

Tryon says: "spire not at all elevated, perfectly plane above."

Binney says: "with very coarse rough striae."

Diameter 5, height 1.75 mm.

Pilsbry, Phila ac pr 1889, p 196, treats Selenites caelata Mazyck as a variety of this.

SELENITES HEMPHILLI W. G. Binn.

Eastern Oregon; Washington.

SELENITES SPORTELLA Gould.

Tyron, Mong T M 33, t 3 f 7.

Macrocyclis sportella Gould.

Whorls 5, the superior part of the last one flattened upon approaching the aperture, rounded below; very light apple green, dull, very closely and sharply striate, reticulated by slight, revolving lines; suture moderate, umbilicus moderate and deep. Diameter 18 mm. Puget Sound to San Diego, California (Orcutt).

SELENITES VANCOUVERENIS Lea.

Large, whorls 5, the superior part of the last one flattened upon approaching the aperture, rounded beneath; bright yellowish-green, shining, roughly striate, with very slight revolving lines, suture moderate, umbilicus of moderate width and deep. Diameter 30 mm. Oregon; Washington; Alaska; western Idaho.

Macrocylis vancouverensis Lea.
Tryon, Mong T M 33, t 3 f 6.

SELENITES VOYANA Newc.

Depressed; whorls 5, convex, the last declining towards the aperture and somewhat flattened or concave above, striate; aperture sinuate above, the lip slightly expanded, its extremities joined by a callus on the body whorl; below broadly umbilicate. Pale horn color. Diameter 12.5 mm. San Diego to Trinity county, California.

Macrocycl:s voyana Newcomb.
Tryon, Mong T M 34, t 3 f 9.

SPORTELLA STEARNSII Dall.

"Shell of moderate size for the genus, inequilateral, not very convex, white, with an almost imperceptible yellowish epidermis; anterior dorsal margin nearly straight, the base parallel with it, the ends bluntly rounded; surface nearly smooth ,with faint incremental lines and microscopic sagrination; teeth normal, strong, the posterior cardinal prominent, vertical; ligament strong, external, on a nymph; resilium well developed, its area of attachment thickened; posterior adductor scar rounded, unusually large. Lon. 13.5, alt. 10, diam. 5 mm. One well-preserved specimen from the Gulf of California, exact locality unknown, is contained in the Stearns collection."—Dall, U S Na Mu pr 21: 885, 879, t 87, f 8, 12 (1899).

SUCCINEA STRETCHIANA Bland.

Keep, West Coast shells, 129.
Tryon, Monog T M 19, t 2 f 5.

Globose-conic, thin, pellucid, shining, striatulate; spire short, obtuse, suture well impressed; yhorls 3, convex, last inflated; aperture roundly oval, columella arcuate, slightly thickened. Greenish horn color. Length 6.25, diameter 5 mm.

Sub-alpine Sierra Nevada, California and Nevada, 4,000 to 6,500 feet altitude.

MYSELLA ALEUTICA Dall.

"Shell small, solid, ovate, white, smooth, covered with a polished straw-colored epidermis with usually 3 or 4 concentric darker colored zones; beaks distinct, often eroded, ends and base rounded, valves moderately convex, teeth strong in the right valve, anterior adductor scar narrow and rather irregular, elongated, posterior rounded, pallial scar linear. Lon. 4.3, alt. 3.3, diam. 2 mm. Bering sea, the Aleutians, and east to Sitka bay, Alaska."—Dall, U S Na Mu pr 21: 892-3, 881, t 87 f 6 (1899).

MYSELLA PEDROANA Dall.

"Shell large, thin, rounded, rather compressed, white, with a concentrically rugose pale-brownish epidermis (to which, in the type, adheres a good deal of blackish oxide of iron); beaks inconspicuous; surface with coarse, concentric, incremental lines; inequilateral; the posterior side short, dorsal margins merging roundly into the distal and they into the basal margin, which last is nearly straight; hinge feeble, the right anterior lamella elongated and very slender, the posterior one shorter and stouter, the resilium subumbonal and very small; adductor scars small, the pallial scar linear. Lon. 9, alt. 7.3, diam. 3 mm. A single shell found on the beach at San Pedro, California."—Dall U S Na Mu pr 21: 893, 881, t 88 f 4 (1899).

MYSELLA PLANATA Dall.

Dall, U S Na Mu pr 881, 892 t 88 f 12 (1899).

Tellimya planata Dall, in Krause; Beitr Moll fauna des Beringsmeers, Arch f Naturg 51 pt 1: 34, t 3 f 6 a-d (1885).

Bering Strait, south to the Aleutians and east to the Shumagin Islands, Alaska.

MYSELLA TUMIDA Cpr.

Dall, U S Na Mu pr 21: 881, 892, t 87 f 7 (1899).

Tellimya tumida Cpr, Suppl R Brit Assoc 1863: 88, 97, 129 (1864). Phila ac pr 1865: 58.

Alaska peninsula, south to San Diego, California.

ERYCINA COMPRESSA Dall.

"Shell large, subquadrate, thin, moderately compressed, white, covered with a conspicuous, thin, wrinkled, partly glossy periostracum; nearly equilateral, the posterior end slightly broader, both ends rounded, the basal margin nearly straight; beaks inconspicuous, surface with strong, irregular incremental lines, but no radial sculpture; pallial scar rather wide and irregular, merging into the subequal, rather narrow adductor scars; resilium large, wide, and long, more or less calcareous ventrally, left valve with one obscure cardinal tooth, right valve with the tooth better developed; the right dorsal valve margins overlap those of the left valve a little, but there are no distinct lamellae. Lon. 13, alt. 13, diam. 6 mm. Dredged on muddy bottom in from 4 to 28 fathoms in the eastern part of Bering sea, south of Nunivak Island, the eastern Aleutians, and southward to Sitka, Alaska, by W. H. Dall."—Dall, U S Na Mu pr 21: 888, 883, t 87, f 1, 8 (1899).

ERYCINA RUGIFERA Cpr.

Dall U S Na Mu pr 21: 887, 880, t 87 f 4 (1889).

Pythina rugifera Cpr Supple R Brit Assoc 1863: 602, 643 (1964). Phila ac pr 1865: 57.

Lepton rude (Dall ms) Whiteaves R Progr Geol Surv Canada 1878-79: 198 B, f 2 (1880).

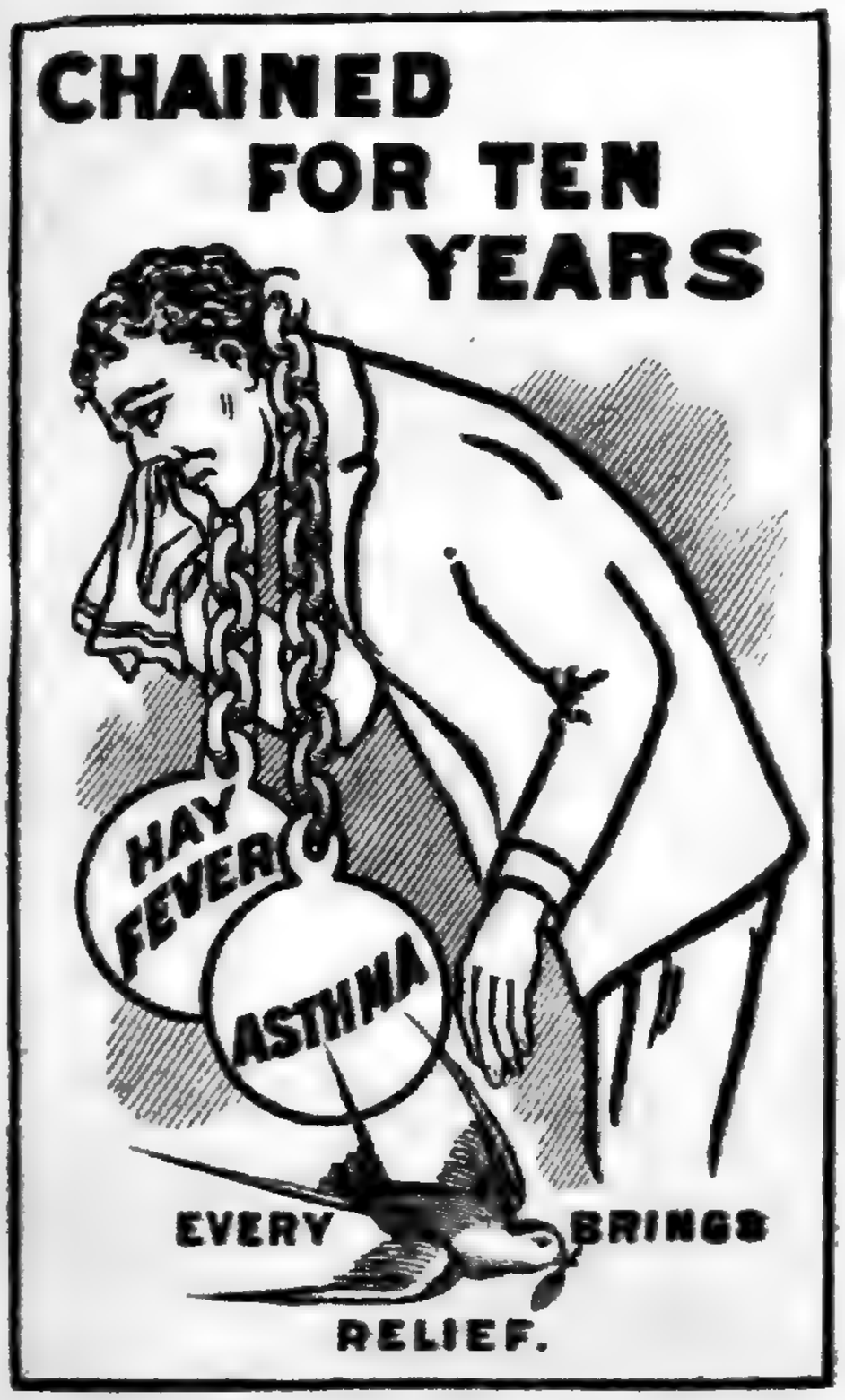
Lives attached to the abdomen of Gebia pugetensis Dane, a burrowing crustacean. Puget Sound.

ASTHMA CURE FREE!

ASTHMALENE Brings Instant Relief and Permanent Cure in All Cases.

SENT ABSOLUTELY FREE ON RECEIPT OF POSTAL.

WRITE YOUR NAME AND ADDRESS PLAINLY.



There is nothing like Asthmalene. It brings instant relief, even in the worst cases. It cures when all else fails.

The Rev C.F.WELLS, of Villa Ridge, Ill., says: "Your trial bottle of Asthmalene received in good condition. I cannot tell how thankful I feel for the good derived from it. I was a slave, chained with putrid sore throat and Asthma for ten years. I despaired of ever being cured. I saw your advertisement for the cure of this dreadful and tormenting disease, Asthma, and thought you had over spoken yourselves, but resolved to give it a trial. To my astonishment, the trial acted like a charm. Send me a full-size bottle."

Rev. Dr. Morris Wechsler.

Rabbi of the Cong. Bnai Israel.

New York, January 3 1901.

DRS. TAFT BROS.' MEDICINE CO.,

Gentlemen: Your Asthmalene is an excellent remedy for Asthma and Hay Fever, and its composition alleviates all troubles which combine with Asthma Its success is astonishing and wonderful.

After having it carefully analyzed, we can state that Asthmalene contains no opium, morphine, chloroform or ether.

Very truly yours, REV. DR. MORRIS WECHSLER.

DR. TAFT BROS. MEDICINE CO. AVON SPRINGS, N. Y., Feb. 1, 1901.

Gentlemen: I write this testimonial from a sense of duty, having tested the wonderful effect of your Asthmalene, for the cure of Asthma. My wife has been afflicted with spasmodic asthma for the past 12 years. Having exhausted my own skillas well as many others. I chanced to see your sign upon your windows on 130th street New York, I at once obtained a bottle of Asthmalene. My wife commenced taking it about the first of November. I very soon noticed a radical improvement. After using one bottle her Asthma had disappeared and she is entirely free from all symptoms. I feel that I can consistently recommend the medicine to all who are afflicted with this distressing disease. Yours respectfully, O. D. PHELPS, M. D.

DR. TAFT BROS. MEDICINE CO. 67 E. 129th st., N. Y., Feb. 5, 1901.

Gentlemen: I was troubled with Asthma for 22 years I have tried numerous remedies, but they have all failed. I ran across your advertisement and started with a trial bottle. I found relief at once. I have since purchased your full-size bottle, and I am ever grateful. I have a family of 4 children, and for 6 years was unable to work I am now in the best of health and am doing business every day. This testimony you can make such use of as you see fit.

Home address, 235 Rivington street. S. RAPHAEL.

TRIAL BOTTLE SENT ABSOLUTELY FREE ON RECEIPT OF POSTAL.

Do not delay, write at once DR. TAFT BROS. MEDICINE CO., 79 E. 130th st. N. Y.

Owing to accidents to our press this number is issued in small form.

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Charles Russell Orcutt, Editor.
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TOURMALINE.

The tourmaline is one of the most interesting of gems, yet but little known, especially under its true name, its diversity of color having enabled it to pass under a multitude of names.

Black and brown tourmaline are usually opaque, and hence have no value as gems. The transparent stones available for gems are found in Maine, Connecticut and California, and in Brazil, Russia and Ceylon. The colored varieties are known correctly under the following names:

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

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

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

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.

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

Dr. A. C. Hamlin published in 1873 a small book, 'The Tourmaline,' of 107 pages and 4 colored plates, devoted mainly to the beautiful crystals of this mineral as found in Maine. On page 62 he says:—

'It seems as though the light of heaven was required in the production of the gems, as it is for the marvellous and varied hues of the flowers of vegetation. Thus far, nearly all of our precious stones have been found on or near the surface of the earth; and it appears as though the contact of the air or a ray of sunlight was required to build up their forms and perfect lines. Down in the thousand mines along the slope of the Rocky Mountains the amethyst vanishes below the depth of 20 or 30 feet, while the same quartz crystallizes in its beautiful and definite but colorless forms in the depths of the deepest mines. The diamond and the sapphire belong to superficial terrains; and we find that the rule of shallow deposit relates to most of the gems. The topaz of Brazil, the beryl of Siberia, the chrysoprase of Silesia, the turquoise of Thibet, or the opals of Hungary, all occur near the surface of the earth, and are never found below a certain depth.'

Oliver Cummings Farrington, in Birds and Nature for September, 1901, says:—

"The crystals are usually in the form of long, slender prisms; They often have the peculiarity of being differently colored in different portions. Thus a crystal may be green at one end and red at the other, and in cross section may show a blue center, then a colorless zone, then one of red and then one of green. Some of the crystals from Paris, Me., change from white at one termination to emerald green, then light green, then pink, and finally colorless at the other termination. In some crystals again the red passes to blue, the blue to green and the green to black.

Tourmalines of different colors have been known in the mountains near San Diego, California, for many years. At Pala the red crystals in lepidolite have been known since 1876, but not until 1898 was this remarkable deposit of lithia mica of known value, when the writer brought it to the attention of great chemical houses. The beautiful radiations of red tourmaline crystals in the delicate lilac lepidolite are seldom of gem value, but are now to be found in nearly every mineral cabinet in the world.

At Mesa Grande, east of San Diego, one of the most remarkable deposits of tourmalines was brought to my notice in 1899. The locality had been known for nearly 20 years, but had previously failed to attract attention. In 1900 the mine produced hundreds of crystals from 1 to 2 inches in diameter, generally 3 or 4 inches or more long, of nearly every shade and tint of color that the world had yet known, except some shades of blue and yellow.

A vein of feldspathic minerals, mostly decomposed, and lying on a granite foundation, contained masses of coarse, purple lepidolite, angular fragments of crystal quartz, and amblygonite, spodumene, and other minerals. In this matrix were the beautiful vari-colored crystals of tourmalines, and loose in the soil composed of decomposed portions of the ledge, were many of the finest gems ever found.

C. R. ORCUTT.

HOUSE HOLD PESTS.

'The Silver Fish' belongs to the lowest order of insects—the Thysanura—is wingless, of very simple structure, worm-like, about 1-3 inch long, tapering from near the head to the extremity of its body, and often one of the most troublesome enemies of books, papers, card lables in museums, startched clothing, and more rarely stored food substances. The entire surface of the body is covered with very minute scales like those of a moth. The head carries 2 prominent antennae, and at the tip of the body are 3 long, bristle-shaped appendages, one pointing directly backward, the other 2 extending out at a considerable angle; 4 shorter appendages are near; 6 legs spring from the thorax, and, while not very long, they are powerful and enable the insect to run with great rapidity.

Heavily glazed paper is very attractive to this insect, while it often causes wall paper to scale off by its feeding on the starch paste. Pyrethrum furnishes the best means of control, wherever it can be applied. C. L. Marlatt describes and figures it in bulletin No. 4, new series, division of entomology, U. S. department of agriculture, from which the above notes are main y taken. Lepisma saccharina L. is the common species of England, now practically cosmopolitan.

METALS AND ORES.

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

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

LITHIUM.—Amblygonite, lepidolite, spodumene, and triphylite are the principal ores of this rare metal, the lightest known.

QUICKSILVER.—Cinnabar is the principal ore.

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

LOUIS AGASSIZ.

Part of an address by David S. Jordan. Teacher's Institute San Diego county.

"I have known and loved as well as a small man can know and love a great one, the man of whom I am to try to give you a picture—probably the greatest man in the history of education in America.

"It was the idea of Agassiz that his pupils were the best pupils in the world, the spot he was occupying the best spot, and the present minute the very best minute in the universe. It is said in Cambridge that it was not necessary to button one's overcoat quite so tightly in passing the house of the genial Agassiz.

"The parentage and early history of this man you can read in the encyclopedia. His mother was possessed of a warm love of nature, and this was inherited by her son. As a boy he wrote to his father: 'I desire that it shall sometime be said that Lewis Agassiz was a good son, a good citizen, and the greatest naturalist of his time.' The greatest naturalist of his time he doubtless was not, for Darwin lived in his time, and in many ways he was greater; but certainly Agassiz was far greater than any who had preceded him. He attended the University of Munich, the greatest university of that time, because it had the best teachers. Many of the discoveries of that time were first reported from the room of Agassiz, which soon became the resort of both teachers and students, and which became known as the 'Little Academy.' The museum of the town still contains many mementoes of the ardent worker who turned every place which he frequented into a bee hive. This young man, while earning but a small salary, found time and means to investigate and give to the world many great truths of nature, never before suspected. One subject which especially interested him was the nature and movements of the glacier. With a few chosen companions, he went upon the great glacier, built a hut, and lived there for seventy days. At the end of which time he gave the world a mass of valuable information which could never have been gathered but by such observation.

"At last, he went to Paris and lived in the Latin quarter. While there, he met Humboldt, who was about to make a tour in Liberia for scientific investigation. Agassiz wished to accompany him, but Humboldt chose a better-known man. About the same time, two young men, Tyndall and Huxley, applied for positions in the University of Toronto, and were refused, as they were not sufficiently well known.

"Agassiz, later, went to England, and thence to America. He came to America for two reasons, one to study the glacier formations; second, to see for himself the great republic, for he was the child of the little Swiss republic.

"Though offered one of the finest of European professorships, he decided to remain in America and become an American.

"He loved the breath of freedom which was in the air of America, and which he had found nowhere else.

"He took a professorship at Harvard college, and went to work. Soon there was a complaint that the college was growing unsymmetrical, and even Emerson suggested that a check-rein be placed upon the ardent young professor. Agassiz replied that instead of checking one branch, it would be better to spur on the other departments, and thus restore the symmetry.

"The work of this new man was entirely different from anything previously known. He went out and talked with fairness and was ready to learn from every one he met. He attended teachers' institutes, and gave the teachers grasshoppers to study. This was ridiculed by teachers and newspapers, but he stood firm, insisting that the only way to study natural history was by studying the thoughts of God in nature for themselves, and not from books or blackboards. No book was allowed to be used till all possible independent investigation had been made.

"In 1873 this great educator decided to hold a sort of educational camp-meeting for instruction of teachers in

natural history. For his class he selected thirty young men and twenty young women, an innovation which aroused an outburst of criticism at first, as it was not considered at all necessary for the young women to be so instructed.

"The meeting place was an island, or reef, of about forty acres in extent, containing a barn, an old shed, a flock of sheep, a willow tree and nothing else. The barn was used as kitchen and dining-room, the shed as laboratory, sleeping places were improvised, and there for three months, under this great teacher, that earnest band of young people studied the book of nature. That summers' work marked an era in education, and natural history has been taught ever since, on the new and scientific plan of personal investigation. The next December, the well-loved teacher died. His pupils buried him in Mount Auburn, and brought to mark his grave a boulder from the same great glacier where he had built his students' hut.

"The barn and the shed of the summer's camp were afterward burned, the captain of the boat which took the students there was drowned, and soon only memories remained of the scene of their work. But on that uninhabited island on the Atlantic coast, in the midst of the solitude of nature, was held the grandest school, under the grandest teacher, that the history of education in America has ever known."

TALKS ON MINERALS.

Teacher's Institute, San Diego county.

It was expected that L. M. Aubrey, state mineralogist, would be present to speak on the subject of "Mineralogy, and Why More Attention Should be Given to It in the Public Schools of the State. Mr. Aubury was not able to be present, however, but he sent a letter which was read by Superintendent Davidson. In part of the letter Mr. Aubury said: "California's mineral wealth is gradually increasing yearly, and as it is an industry that has proven its stability, and is one of the state's chief sources of wealth, I believe that a more general knowledge by pupils, concerning the various classes of minerals that are produced is necessary, and that they should have a better geographical idea of the localities where these minerals are found. To illustrate the extent of this industry in California, the mineral statistics collected by the state mining bureau for the year 1900 show that there were produced mineral substances of a valuation of $32,622,945.

"There are also to be found many metals which exist in quantity, but which, owing to local conditions, cannot at this time be profitably mined, but which will unquestionably be treated successfully in the near future, as modern methods are advanced."

Mr. Aubury advocated the teaching of mineralogy by having in the schools collections of the minerals and metals of the state, and particularly of the locality in which the school is situated. He promised the assistance of his department in making the collection if the trustees would see that they were put to use.

W. H. Holcomb spoke for some minutes on the subject of the minerals of this county.

SCHOOL GROUNDS.

R. C. Allen, at Teacher's Institute.

"In the matter of efficiency and general high character of our country schools I believe that our state makes a favorable comparison with any other in the union, and so far as that is true we have reason to be proud; but as, in a race, the leader, if followed by his contestants, cannot afford to lag, so we cannot afford to relax our efforts to keep our schools in the front rank. We must insist on more and more thorough preparation and well-rounded education on the part of our teachers. Through the generosity and good judgment of our state government we are enabled to pay our teachers higher salaries than rule for similar work in the older states, and therefore we are justified in expecting and requiring a full equivalent of service from them. I believe that as a rule we are getting interested and enthusiastic work from our teachers, but in this world perfection is rarely attained and improvement is nearly always possible.

"I am informed by our superintendent that in some districts he finds great laxity on the part of the clerks in the matter of filing their records. It sometimes occurs that all records are lost and this causes serious inconvenience to him, and also to the new clerk, where the fault has been that of a predecessor. In the superintendent's office at the court house, will be found boxes provided for this special purpose of filing away the records of each district, where they may be safe from loss or destruction. It is hoped that district clerks will make use of these filing cases."

THE QUEST OF HAPPINESS.

Part of an address by D. S. Jordan.

"I wish in this address to make a plea for sound and sober life. I base this plea on two facts: to be clean is to be strong; no one can secure happiness without earning it.

"Among the inalienable rights of man—as our fathers have taught us—are these three: "Life, liberty, and the pursuit of happiness." So long as alive and free, he will, in one way or another, seek that which gives him pleasure, hence life, liberty, and the pursuit of happiness are in essence the same. But the pursuit of happiness is an art in itself. To seek it is not necessarily to find it, and failure may destroy both liberty and life. Of some phases of this pursuit I wish to speak today. My message is an old one. If by good chance some part of it is true, this truth is as old as life itself. And if it be true, it is a message that needs to be repeated many times to each generation of men.

"It is one of the laws of life that each acquisition has its cost. No organism can exercise power without yielding up part of its substanse. The physiological law of transfer of energy is the basis of human success and happiness. There is no action without expenditure of enrgy, and if energy be not expended, the power to generate it is lost."

"In every walk of life, strength comes from effort. It is the habit of self-denial which gives the advantage to men we call self-made. He has learned the value of money and of time, and he has learned to resist the temptation to throw either away. He has learned to say "no" and to say it at the right time.

"If we would have the Puritan strength we must hold to the Puritan's hatred of evil. Our course of life must be as narrow as his; for the way that leads to power in life must ever be short and strong. It is still true, and will be true forever, that the broad roads and flowery paths lead to weakness and misery, not to happiness and strength. There is no real happiness that does not involve self-denial.

"In general, the sinner is not the man who sets out to be wicked. There are some such fiends by blood and birth, but you and I do not meet them very often. The sinner is the man who cannot say "no." For sin to become wickedness is a matter of slow transition. One virtue after another is yielded up as vice calls for sacrifice. The primal motive of most forms of sin is the desire to make a short cut to happiness. We yield to temptation because it promises pleasure without the effort of earning it. The promise is never kept. The unearned pleasures are mere illusions. They leave "a dark brown taste in the mouth"; their recollection is 'different in the morning.'

"But true happiness leaves no reaction. The mind is at rest within itself and the consciousness is filled with the joy of living."

Dr. Jordan classified the short cuts to happiness which temptation commonly offers into five classes:

Indolence—the attempt to secure the pleasure of rest without the effort that justifies rest and makes it welcome;

Gambling—the desire to get something for nothing. Burglary and larceny have the same notive. The difference is one fixed by social customs and prejudices—the thief may be a welcome member of society if he is the right kind of a thief.

Licentiousness—The search for the unearned pleasures of love, without love's duties or love's responsibilities. The way to unearned love lies through the valley of the shadow of death. The

path is white with dead men's bones. Just as honest love is the most powerful influence for good that can enter into a man's life, so is love's counterfeit the most disintegrating. Love is a sturdy plant of vigorous growth, with wondrous promise of flower and fruitage, but it will not spring from the ashes of lust.

Precocity—In the hot bed of modern society there is a tendency to precocious growth. Precocious virtue, as the Sunday school books used to describe it, it bad enough, but precocious vice is most monstrous. Precocious fruit is not good fruit. The first ripened apples have always a worm at the core. What is worth having must bide its time. To seize it before its time is to pluck it prematurely. The immature child is brought at once among temptations he cannot resist because he cannot understand them. Vulgarity has in some measure its foundation is precocity. It is an expression of arrested development in matters of good taste and good character.

Intemperance—The basis of intemperance is the effort to secure through drugs the feeling of happiness when happiness does not exist. Men destroy their nervous system for the tingling pleasures they feel as its structures are torn apart. There are many drugs which cause this pleasure, and in proportion to the delight they seem to give is the real mischief they work.

While all this is true, I do not wish to take an extreme position. I do not care to sit in judgment on the tired woman with her cup of tea, the workman with his pipe or his glass of beer. A glass of claret may sometimes help digestion by a trick on the glands of the stomach. A cup of coffee may give an apparent strength we greatly need. A good cigar may soothe the nerves. A bottle of cool beer on a hot day may be refreshing. A white lie oils the hinges of society. These things are the white lies of physiology.

"I makes no attack on the use of claret at dinner, or beer as medicine. This is a matter of taste, though not to my taste. Each of these drugs leaves a scar on the nerves; a small scar, if you please, and we cannot go through the battle of life without many scars of one kind or another. Moderate drink-scar on the nerves; a small scar, if stays moderate. It is much like moderate lying—or, to use Beecher's words, words, "like beefsteak with incidental arsenic."

But the point of all I have to say is this: What is worth having comes at the cost which coresponds to its worth. If the end of life is to enjoy life, we must so live that enjoyment is possible to the end. All forms of subjective enjoyment are pleasures that begin and end with self, and are unrelated to external things, are insane and unwholesome, destructive to effectiveness in life and of rational enjoyment. And this is true of spurious emotions alike, whether the pius ecstacier of a half starved monk, the neurotic excesses of the sentimentalist, or the riots of a debauchee.

It is not for you to seek strength by hazard or chance. Power has its price, and its price is straight effort. It is not for you to seek pleasure and strength in drugs, whose only function is to deceive you, whose gifts of life are not so real as your own face in the glass. It is not for you to believe that idlenes brings rest, or that unearned rest brings pleasure. You are young men and strong, yong women in your full strength, and it is for you to resist corrosion, and to help stamp it out of civilized society. A man or woman ought to be stronger than anything that can happen to him. He is the strong man who can say "No." He is the wise man who, for al his life, can keep mind and soul and body clean.

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