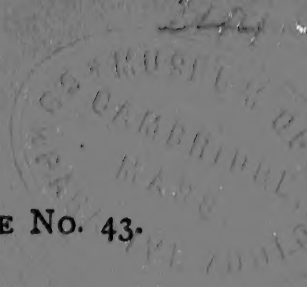


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VOLUME VI.

^{Sum} MAY, 1889.

WHOLE No. 43.

THE
West ♦ American ♦ Scientist.

*A popular monthly review and record for the Pacific Coast.
Official Organ of the San Diego Society of Natural History.*

C. R. ORCUTT, - - - EDITOR.

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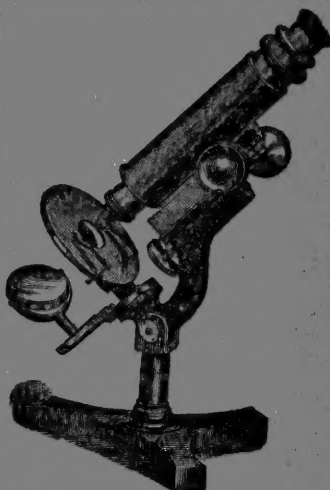
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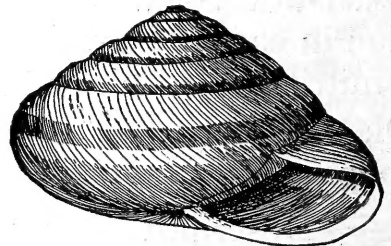
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THE WEST AMERICAN SCIENTIST.

VOL. VI.

MAY, 1889.

No. 43

THE DESERT IN JUNE.

At this season of the year, that desolate, barren waste, generally called the Colorado Desert, is not a very inviting field for the botanist. During the months of June and July, 1888, the editor improved an opportunity for traversing a portion of this region, and a few notes on the very limited, but necessarily characteristic vegetation at this season, will perhaps best illustrate the botanical aspects of the region visited.

From San Diego city we proceeded to Warner's ranch, thence to the Colorado Desert through a branch of the San Felipe canyon, where we began to take notes of the vegetation, and then across the big basin—the desert proper—into the Chuckawalla mountains, in the northeastern portion of San Diego county.

We will divide the route traversed into ten sections, treating each independently so as to speak more accurately of the distribution of plants that are characteristic of the region.

I.—SAN FELIPE CANYON.

Upon reaching the divide near Warner's ranch, where the waters flow towards the Desert and the Pacific Ocean respectively, we commenced a descent into what we called Grapevine canyon, a branch opening into the San Felipe canyon that in turn opens out upon the plains of the desert proper. Cottonwood or Grapevine springs, receiving these respective names from the presence of two fine cottonwood trees and a luxuriant growth of *Vitis californica*, Benth., are situated at the head of this canyon where we first entered it. Around these springs were naturally observed many plants that are found west of the mountains, but the greater portion were characteristic of the desert flora. The following is a list of the species noted in this canyon. Those in italics we may consider as belonging to the desert flora; those marked with an asterisk, as growing around the spring:

Argemone hispida, Gray.
Isomeris arborea, Nutt.
Krameria canescens, Gray?
Fouquieria splendens, Engelm. II.
Larrea Mexicana, Moric. II.

Erodium cicutarium, L'Her.
Zizyphus Parryi, Torr.
 **Vitis californica*, Bth.
 **Rhus ovata*, Watson.
 **Melilotus parviflora*, Desf.

- Hosackia glabra, Torr.
Dalea californica, Watson?
 "——II.
 "
Prosopis juliflora, DC.
Acacia Greggii, Gray.
Olneya Tesota, Gray.
Prunus ilicifolia, Walp.
Adenostoma fasciculatum, H. & A.
Ribes Menziesii, Pursh?
Eulobus californicus, Nutt.
Petalonyx Thurbeii, Gray.
Cucurbita californica, Torr.? II.
Mamillaria ——
Echinocactus Wislizeni, Engelm.
 var.
Cereus Engelmanni, Parry.
Opuntia basilaris, II.
 " *Bigelovii*, Engelm. II.
Opuntia occidentalis, Engelm.?
 "——II.
 "——II.
 **Sanbucus glauca*, Nutt.
Gutierrezia californica, T. & G.
Bigelovia brachylepis, Gray.
 " *graveoleus*, Gray.
Pluchea Corealis, Gray.
Viguiera Parishii, Greene.
Porophyllum gracile, Bth.
Artemisia tridentata, Nutt.
Senecio Douglasii, DC.
Stephanomeria virgata, Bth.?
Asclepias eriocarpa, Bth.
Phacelia ——? (dried).
 **Heliotropium Curassavicum*, L.
- **Cressa cretica*, L.
 **Cuscuta Californica*, Choisy.
 **Datura*——II.
 **Nicotiana*
 **Scrophularia Californica*, Cham.
Pentstemon antirrhinoides, Bth.
 " *centranthifolius*?
Chilopsis saligna, Don. I.
Cheilanthes myriophylla, Desv.
Pellaea Ornithopus, Hook.
Beleperone Californica, Bth.
 **Salvia Columbariae*, Bth.
Andibertia polystachya, Bth.
Mirabilis multiflora, Gray.
Eriogonum fasciculatum, Bth.
 " *trichopodium*, Torr.
 " *nudum*, Dougl.
Oxytheca trilobata, Gray. (dried)
Chorizanthe laciniata, Torr. (dried)
Atriplex canescens, James. II.
Simmondsia Californica, Nutt., var.
Euphorbia polycarpa, Bth. II.
 **Houttuynia Californica*, B. & H.
 **Salix* ——?
 **Populus Fremonti*, var. *Wislizeni*?
Quercus pungens, Engelm.
Phoradendron juniperinum, Eng.?
Ephedra Californica, Watson.
Pinus monophylla, Torr. & Frem.
Agave deserti, Engelm. II.
Yucca baccata, Torr.
 " *Whipplei*, Torr.
 **Distichlis maritima*, Raf.
Juniperus Californicus, Carr.

A few of the above, like the pine, were confined to the sides of the canyon; of others only a single individual was noticed, and many were not in condition for positive identification. Some few grasses and perhaps a few other plants escaped attention.

II.—MOUTH OF SAN FELIPE CANYON TO BORREGO SPRINGS.

The second stage of the journey was along the dry washes and along the base of the foothills bounding the desert. In the wash from the canyon were naturally found many of the same species as are noted above, and these we have marked (II) in the above list. No additional species were observed in this section, except a few compositæ which we failed to recognize as they were not 'in condition.' It will be noted that the variety of vegetation had become greatly reduced, and many of these were confined to the San Felipe wash.

III.—BORREGO SPRINGS.

These springs are situated near the proposed line of the San Diego, Cuyamaca and Eastern railroad, at the base of the mountains. More or less salt and alkali are held in solution in the

water, and incrust the surface of the ground. The springs are simply holes dug two or three feet, in a broad, marshy tract that is covered with grasses and junci. The following plants were observed around the 'spring:'

Cleome lutea, Nutt.	Houttuynia Californica, B. & H.
Melilotus parviflora, Desf.	Opuntia———?
Prosopis juliflora, DC.	Pluchea borealis, Gray.
Lycium———?	Xanthium strumarium, L.
Salicornia———?	Distichlis maritima, Raf.
Suaeda———?	'Cane grass.'
Euphorbia polycarpa, Bth.	Helianthus———?

Thousands of acres of good, arable lands lie around these springs that may sometime be available for cultivation. Pure water can be obtained on portions of the tract probably, or at least could be brought into the tract from the mountains for irrigating purposes. The surrounding hills are mostly absolutely bare of vegetation.

IV.—BORREGO SPRINGS TO INDIAN OR FISH SPRINGS.

Between these camping places we noted the following plants:

Krameria canescens, Gray?	Atriplex canescens, James. V.
Larrea Mexicana, Moric. V.	" hymenelytra, Wats. V.
? Hoffmanseggia sp. (dried).	Sida hederacea?
Dalea	Cucurbita Californica, Torr.?
Prosopis juliflora, DC.	Salicornia———? V.
Petalonyx Thurberi, Gray.	Suaeda———? V.
Opuntia Bigelovii, Engelm.?	Croton———? V.
Bigelovia———?	Distichlis maritima, Raf. V.
Franseria dumosa, Gray? V.	Hilaria rigida, Thurb. V.
Coldenia Palmeri, Gray. V.	Washingtonia filifera, Wend. V.
Chilopsis saligna, Don.	Asclepias erosa, Torr. V.

With the addition of a few compositæ and other species not recognizable, no other species were met with in the thirty miles traversed between these springs. A few palm trees were seen at a distance among the hills, and one was growing by the roadside which proved to be a robust form of Washingtonia filifera. Wend. My companion informed me that a single dead plant of cereus giganteis, Engelm., was to be found near the route we traveled, but on a trail off from the wagon road.

V.—CLAY HILLS TO FISH SPRINGS.

This section is included in the last, but is well worth noting separately. These clay hills are found between Borrego and Indian springs. For eight miles franseria, hilaria, and a few bushes of larrea formed the sum total of the vegetation, and franseria was often alone and without 'near neighbors,' even of its own species. The clay hills were totally devoid of vegetation, but a few interesting plants were observed in the washes and deep canyons which we traversed. Some of these are indicated in the preceding list (V).

VI. INDIAN OR FISH SPRINGS

At Indian springs, some fifteen miles northwest of the Southern Pacific railway station called Salton, were found several large pools of rather warm water, surrounded with an almost impenetrable mass of tules, cane grass and mock willows (*plushea borealis*). A little fish was found quite abundant in these pools, and also at the similar pool at Dos Palmas springs, on the other side of the railroad. The mesquite and screw bean, *coldenia palmeri*, *heliotropium curassavicum*, *distichlis*, and the *rietta* grass, (*Hilaria rigida*, *nunb.*), sedges and *junci*, formed the bulk of the wild vegetation. A tall cottonwood and two or three young palms were growing at the Indian rancherie, where a white man had planted a small grove of fig and other fruit trees some years ago. The figs are doing well and the Indians raise early vegetables, melons, etc.—enough for their own needs. They were harvesting a good supply of the mesquite beans at the time of our visit, picking the pods from the trees and grinding into meal, forming large cakes, and baking them in the sun, for future use.

VII.—THE BASIN.

The next stretch of country, from Indian springs to Salton, is quickly described. Salton is said to be 250 feet below sea level, and the intervening land between the station and Indian springs is lower still, and strongly impregnated with alkali. The vegetation on this low land consists almost exclusively of *salicornia*—and that very scattering, or wholly absent in many places. A dead mesquite, a *suaeda* and two *atriplex* plants were the only additional plants observed. 'Dry Lake' lies southeast of the route followed, adjoining Salton on the south, and is totally devoid of vegetation. The ground is too soft to allow of man or beast crossing—the 'dry bog' swallowing up anything that ventures upon it. The dry bogs may be considered one of the greatest dangers connected with the desert.

VIII.—SALTON TO DOS PALMAS SPRINGS.

Between Salton and the Dos Palmas springs the vegetation was found similar to that between Borrego and Indian springs. At Dos Palmas springs we leave the desert basin and enter into the Chuckawalla (or Lizard) mountains.

IX.—DOS PALMAS SPRINGS.

At Dos Palmas springs (so called from its two fine palm trees) were hundreds of mesquite, screw bean and other trees of the same order, and luxuriant cane grass and tules around the pools of water. The following is a list of the principal plants noted in the vicinity:

Larrea Mexicana, Moric.
Dalea

Prosopis juliflora, DC.
 " *pubescens*, Bth.

Olneya Tesota, Gray.
Parkinsonia Torreyana, Wats.
Petalonyx Thurberi, Gray.

Opuntia———?
 **Sesuvium Portulacastrum*, L.
 **Pluchea camphorata*, DC.
 **Baccharis Douglasii*, DC.?

Franseria dunosa, Gray.?
Asclepias subulata, Decsne.
 **Eustoma exaltatum*, Griseb.
Coldenia Palmeri, Gray.
Eriogonum trichopodum, Torr.?
Chilopsis saligna, Don.
Atriplex hymenelytra, Watson.
 " ———?
Croton———?
 **Washingtonia filifera*, Wendl.
Hilaria rigida, Thurb.
 **Distichlis maritima*, Raf.

Those found around the water only are marked with an asterisk; those which are in italics belong exclusively to the desert flora.

X.—PACIFIC MINING DISTRICT:—CHUCKAWALLA MOUNTAINS.

The Chuckawalla mountains form a portion of the Colorado Desert, and are virtually devoid of vegetation except in the washes. A few hills support a sparse vegetation. The Pacific Mining District is in the midst of these mountains or hills, where a much greater variety of plants was found than on the plains of the desert, as will be seen by the following list:

Krameria———?
Fouquieria splendens, Engelm.
Fagonia Californica, Bth.
Larrea Mexicana, Moric.
Dalea
 "
Parkinsonia Torreyana, Watson.
Opuntia Bigelovii, Engelm.
 "
 "
Cereus Engelmanni, Parry.
Echinocactus Wislizeni, Engelm.
Franseria dumosa, Gray.?
Nicotiana———?
Chilopsis saligna, Don.
Beleperone Californica, Bth.

Hyptis Emoryi, Torr.
Eriogonum trichopodum, Torr.

Simmondsia Californica, Nutt.
Euphorbia polycarpa, Bth.
Ephedra Californica, Watson.
Olneya Tesota, Gray.
Prosopis juliflora, DC.
Acacia Greggii, Gray.
Petalonyx Thurberi, Gray.
Cucurbita Californica, Torr.?
Mamillaria Grahamii.
Nolina Bigelovii, Watson.
Hilaria rigida, Thurb.
Notholaena Parryi, Eaton.
Echinocactus polycephalus.

No water is found on the surface in that portion of the district visited. A few lichens were found on the ground in favorable situations, but none were noticed on the rocks—they may have been abundant without attracting my attention, however.

The presence of the mesquite (*prosopis juliflora*, D C.) is considered an indication of water near the surface (within twenty feet), while the presence of *pluchea borealis* indicates that water is not over five feet from the surface. The palm is found only near water—usually beside springs.

The general impression existed in my mind that cacti in great variety abounded on the Colorado Desert, as so many species are credited to this region. But I found them restricted almost

wholly to the washes and rocky slopes among the hills bordering the desert, while the broad, sandy or gravelly plains that constitute the big basin were almost destitute of these plants, presenting only a few stray *Opuntias* that maintained a very precarious foothold. But in the Pacific Mining District I found them in great variety and abundance, growing among the crevices in the rocks and often forming impenetrable thickets along the washes.

THE DEER OF SOUTHERN LOWER CALIFORNIA.

(Written for the WEST AMERICAN SCIENTIST.)

Judge Caton, in his excellent work, *The Antelope and Deer of America*, Second Edition, year 1881, page 337, says: "The mule deer in the Rocky Mountains is four times as large as in Lower California, which difference is also supplemented by the fact that the change in the antler is quite as great, for, on all of the small variety the antler has ceased to be bifurcated, but presents a spike like that of the yearling deer of the north; or if ever bifurcated, that feature is as rare as on the first antlers of the better developed variety of the north, and yet I do not hesitate to rank them in the same species, from their exact similitude in all other respects, according to the reliable information received of them."

On page 119, he refers to it as "a remarkable variety of the mule deer, found by Mr. John Xantus, as I am informed by Professor Baird, one of the most reliable collectors of the Smithsonian Institute, who forwarded several specimens to Washington, from Cape St Lucas, Lower California. With all the other indicia of the mule deer, they are very diminutive in size" and have spike antlers about six inches in length. I have not been able to learn that this diminutive mule deer has been met with except in the lower part of the peninsula, and the extent of its habitat there, is as yet uncertain."

I have no doubt that the specimens Xantus forwarded to the Smithsonian were yearling males, which are generally known as "Spike Bucks" though I have not seen those specimens. There is but one species of deer in the Cape region, and that is a fine large animal, quite equal in size to the mule deer of the Rocky Mountains, and the males have antlers as perfect, as profusely branched, and not materially different from the antlers of the deer of California, of corresponding ages.

I saw more than a hundred pairs of antlers in various parts of the Cape region, and of these but one pair deserves special mention. The unusual pair were from a "Capon,"—so the hunter who had them said. They were vertical, thick, angular, very rough and in velvet. One prong was twelve inches long, the other three inches longer.

It is well known that these unfortunates rarely or never have

perfect antlers, consequently these exceptional antlers signify nothing.

The Mexican hunters, of whom I inquired concerning the deer of the country, invariably told me there were "tres classes" (three kinds) of males, which they distinguished by the antlers, and I suppose they said there were three species of deer there; but after I became convinced from much observation that there was one species of deer in this part of the peninsula, I asked how many classes of females there were. "Uno, no mas, Senor" (one, no more) was the invariable reply.

I saw a skin at Miraflores, in possession of Senor Vidal Collins, which must have been taken from a deer that would have weighed over three hundred pounds, live weight, if in good condition; and I shot a buck in the Victoria mountains, which probably weighed two hundred and fifty—so heavy, in fact, that Dr H. ten Kate, myself and Francisco Amador, the guide, had much difficulty in dragging it, with united effort, up the canon about one hundred yards.

L. Belding.

THE DIGGER'S DUFF.

If every day were Sunday,
And Sunday always fine
I'd ask no spacious mansion
Wherein to sit and dine;—
The digger's canvas palace
For me were large enough,
Where, happy, free and healthy,
I'd live on 'digger's duff!'

If every day were Sunday,
And Sunday always fine,
If youth were but eternal,
Such freedom should be mine
But sickness or bad weather
Would spoil it sure enough;
I'd pine beneath the canvas,
And shirk the 'digger's duff!'

So farewell, wooded gully,
And digger's camp farewell;
Of you in scenes far distant
This pinch of gold shall tell;
And fancy oft shall lead me
Where down the pathway rough,
In Santa Clara's 'campment
I tasted 'digger's duff!'

Wych Elm.

CHANGES IN THE COLOR OF GRAPES GROWN IN NORTHWESTERN MEXICO.

(Written for the WEST AMERICAN SCIENTIST.)

The village of San Jose de Guaymas is nine miles north of Guaymas proper. At the village are numerous gardens, which supply the city of Guaymas with fruit and vegetables. As there is no certainty when rain will fall, or the amount, the cultivators have recourse to wells. The soil has more the appearance of that found about old dry river beds than anything else, and one unacquainted with its quality would decide it was worthless; but with water and heat, many of the finest varieties of grapes are grown—not surpassed in size of bunches or flavor of fruit by the grapes of California.

Some kinds of grapes, known in other localities by their distinctive colors, are here so modified or entirely wanting in their natural color as to be unrecognizable.

FLAMING TOKAY.

Here this beautiful grape belies its name, for it gradually and variously changes its color until the fifth year, when the original color is an exception, and a greenish white is the new hue taken on. Sometimes all the bunches of a vine are of that color; on another vine a bunch may have a few berries with a slight tinge; then another with three or four together nearly as deeply tinged as the original. Then a large bunch may have a number of berries very slightly shaded, or there may be here or there one tinged; while several bunches on the same vine are not the least tinged. In fact, the fruit of some entire vines is a greenish white, and they are therefore not easily recognizable.

OLD MISSION GRAPE.

This grape is remarkable for its eccentricity of coloration. On the same vine and bunch, the berries may be of every shade of reddish black or purple to greenish white. On some vines all bunches will be nearly of the original color, while the bunches on another vine may be purely greenish white; or a vine will have a bunch or two variable in color.

BLACK PRINCE.

This well known black grape is seldom seen here in his genuine black dress, but in every shade of black or brownish black—or with the slightest tinge of those colors, or not at all colored, being more like the Sweetwater in hue, yet perfectly ripe. There are vines that grow side by side with the changeable ones, yet their fruit is not the least affected in color; for instance, the Sweetwater, Malvadeir, the Rhine-wine grape and a large one

from the coast of Africa. Some of these, are as dark in their color, naturally, as the grapes before mentioned, that change color so variably, yet are not the least altered in hue; while the others last mentioned, some being white or nearly so, have no dark color infused through the berries.

Why should the berries of certain dark-colored grapes be deprived of their usual color, and others, that are light in color not have any dark shades added to them? Yet they grow in precisely the same soil and climate, and are watered alike.

Edward Palmer.

A NEW SPECIES OF CEREUS.

CEREUS COCHAL, n. sp. Plant three to ten feet high, much branching from a short woody trunk, widely spreading; stems one to ten feet long, two and one-half to six inches or more in diameter, with six or eight obtuse ribs and wide shallow intervals between; areolæ slightly woolly and widely separated on the ribs; the ligneous spines stout, straight and flattened, grayish or black, the central spine erect, nine lines long or more, the five radical spines shorter; flowers appearing on old and young branches alike and remain open both night and day, an inch long or less and of the same width when fully expanded; petals spreading, light green tinged with purple on the outer ones, usually sixteen or more in number, oblong; ovary small with six to thirteen scales with woolly axils and a few almost obsolete slender spines an eighth of an inch or less in length; filaments white, anthers brownish white; the five or six stigmata also white; fruit edible (said to be collected by Indians for food), of a pleasant acid taste, nearly globular, six to nine lines in length, blood red in color (or frequently of a grayish or yellowish brown on the outside) with numerous rather large seeds; corolla often persistent, when deciduous leaving a small, rough umbilicus.

This species is found abundant among the hills of Lower California from Todos Santos bay southward to the Rosario and San Fernando missions, or further, where it was found in bud, flower and fruit during April and May, 1886. Well known to the Mexicans and Indians as the *cochal*. Two flowers were found growing on one plant from the woolly area above a single cluster of spines; a few small spines usually precede the flowers in this area. The short woody trunk is often a foot in diameter, and the ligneous portion of the older branches become several (two or three) inches in diameter, of a firm hard texture, making excellent firewood. The spines are deciduous on the older branches.

A small six-inch cutting was easily rooted in our garden in San Diego, and bore about twenty blossoms before it had made many roots. It has since been transplanted and still thrives, showing that it is an excellent species for cultivation.

C. R. Orcutt.

SOME NATIVE FORAGE PLANTS OF SOUTHERN CALIFORNIA.

A feature of the Paris Exposition, opened the first of May this year, is a display of the native forage plants of the United States, with such notes on each species as were available. As the editor was called upon for material and information concerning the forage plants of Southern California, and especially concerning the burr clover and alfilaria, we have prepared the following notes, which we should be pleased to have supplemented by any of our readers.

ALFILARIA.

Spanish or pin clover, more generally known as alfilaria or 'filaree,' is now abundant throughout Southern California and southward in Northern Lower California. It is supposed to be a native of Southern Europe, but must early have been introduced into this country by the Spaniards, if not, as some contend it is, indigenous to our soil. There are two species popularly included under this name, *Erodium cicutarium*, L'Her., and *E. moschatum*, L'Her., of botanists, belonging to the geranium family. The latter species has less finely divided leaves, and is more robust and rank in its growth, but both species may usually be found growing together.

It is a valuable forage plant for the dry regions of the west, and may be found in equal abundance in the valleys, and on the table lands or mesas. In even the driest seasons it does not fail to mature its seed, thus being prepared for a more favorable year, by husbanding its resources and utilizing the little moisture at its command, content to flower and mature its seed when scarce an inch high if necessary. In favorable seasons and localities it attains a height of two to three feet or more, deferring the act of fruiting until the last thing.

A quantity of this plant was gathered to dry for the Paris Exposition in the last of February, before it had thought it necessary to flower. But little time remained for it to reach its destination and we could not wait for it to attain the proper condition. Owing to the abundant rains, the season was especially favorable to vegetation. The alfilaria plants were cut off at the roots and placed in the hot sun away from the ground to dry. But they were not inclined to adapt themselves to our wishes. The leaves independently persisted in remaining as bright as ever, erecting themselves partly in the hot sun, only a few of the older, lower leaves even wilting. The plants promptly realized the change in their conditions and began flowering profusely and holding up well developed seed heads to the sun, determined to mature all the seed they had intended to produce, and so they lost the one opportunity for visiting the brilliant French capital!

Alfilaria is unwilling to be made hay of before it is ready, and

when it is ready it cures itself on the ground without the assistance of man. It furnishes in this way excellent pasturage for stock during the dry weather, remaining as well cured hay on the ground. It is seldom cut and stored up for stock, other plants being more easily utilized in this way.

The seeds are admirably adapted to stocking the ground anew each season, screwing themselves into every crack and crevice in the sun-baked earth where they patiently await the winter rains.

Alfilaria is not only one of the more valuable of our wild forage plants, but has become one of the most common weeds in our gardens; it is not especially troublesome, even when most abundant, and is much less objectionable than the plants which would probably take its place were it absent. Probably the most abundant and troublesome weed with us is a species of *Malva*.

A friend recalls seeing the alfilaria growing freely on the roofs of houses in Switzerland.

BURR CLOVER.

Like the alfilaria, this is credited with being a native of Southern Europe, early introduced to this coast. It is now widely distributed, and by its so well adapting itself to our soil, we might well overlook its not being strictly American, even if we were quite sure that it is not indigenous.

This plant grows abundantly in many of our fertile valleys and canyons, and, like the alfilaria, it makes well cured hay in the sun. It produces an abundance of burr-like seed pods, from which it receives its name, and it is its seed that makes it a valuable and nutritious hay, especially valuable for horses. Unlike the alfilaria, it is frequently cut for hay, and may be considered a more valuable forage plant—one that is perhaps worthy of extensive cultivation.

THE MESQUITE.

The mesquite tree (*Prosopis juliflora*. Dc.), the screw bean (*P. pubescens*, Bth.), and other allied trees are, in a sense, the most valuable forage plants indigenous to the arid regions of the west, producing as they do an abundance of fruit of great nutritive value both for man and for his dependents, while even the foliage for browsing has often proved valuable to the traveler.

The ripe pods of the mesquite bean are light straw color, thick and mealy, pleasantly pungent and sweet. Horses and mules, and probably other stock, eat them with avidity and grow fat on this diet without other forage, and wild animals appreciate their value, even the coyote, failing of a rabbit, not despising a meal of them.

Among the Indians, who occupy the borders of the Colorado Desert, the pods of the mesquite tree form a no small nor unimportant part of their harvest. They collect in pods in great quantities, and grinding them into a coarse meal, sifting out and

flinging away the small, hard seed (which are passed undigested by animals). The meal is then made into large cakes and baked in the sun, making a very palatable and nutritious bread. The crisp mealy pods are not unpleasant eating for a hungry man, and when prepared as above are almost as agreeable as sweet cakes.

The large yield of this tree, which grows in the hottest portions of our so-called desert lands, in this county, must render it worthy cultivation when these regions are further developed. Hundreds of bushels of these pods or fruit are now allowed to go to waste on the Colorado Desert—sufficient to support a large population, and there is but little doubt that in the past history of that region large bands of Indians thus derived a part of, if not their principal support. Would it be strange if history should repeat itself in this instance?

The mesquite tree grows about twenty feet high, and a grove of them, when out of leaf, reminds one of an old New England apple orchard in the fall. The leaf is of a delicate green, finely divided like most *Acacia* leaves, and grows easily wherever water (even if salt or alkali is held in solution) may be found near, or within twenty feet of the surface. The pods are six inches to a foot or more in length. The tree seems to require the dry atmosphere of the interior arid regions, for near the coast, in a moister atmosphere, it is only a stunted shrub. West of our mountains, where it is reached by the sea breezes, the fruit seems to lack almost entirely those qualities, which make it so valuable when grown on the desert. The pods are tough, thin, and bitter, not mealy and sweet.

The screw bean is less abundant and less valuable in many respects. The wood of both trees is hard, valuable for fire wood, and would be useful in wood work on account of the deep, rich coloring.

Parkinsonia Torreyana, Watson, the *Palo verde* of the Mexicans, the iron wood (*Olneya Tesota*, Gray), and *Acacia Greggii*, Gray, are allied trees found growing in the more sterile regions of the west and share some of the useful qualities of the mesquite.

C. R. Orcutt.

ON THE PHOSPHORESCENT SPOTS OF PORICH- THYS MARGARITATUS.

Professor J. S. Kingsley has given a short account of the phosphorescent organs of *Porichthys margaritatus*, describing them as constituting a new type. The fact that most of the fishes possessing similar organs live in deep water and are therefore dead when they reach the surface renders problematical the function of their so-called phosphorescent spots; these spots have generally been considered to be phosphorescent. The fact that

a fish possessing such organs lives in shallow water is, therefore, of considerable interest.

Porichthys is nocturnal in its habits. It probably remains in the deeper water of the bay during the daytime, not having been caught in the fishermen's nets in daylight so far as we are aware, but is reported to be quite frequently taken at night. We have it from hearsay that specimens have been caught with hook and line during the day. In March, 1889, we saw the fishermen draw their seine after 8 o'clock P. M., when they caught four specimens. The fish were not phosphorescent when brought ashore. Two of them were taken in a bucket of sea-water to our laboratory, but they showed no signs of phosphorescence. One was dissected; the spine was cut and the spinal cord irritated; neither these methods nor local irritation of the spots caused any phosphorescent gleams. The other specimen was kept alive several days in fresh sea-water. It was watched at night when undisturbed and when irritated, but there was no phosphorescence in either case.

The phosphorescent spots must either be continually and involuntarily phosphorescent or they must emit gleams at the will of the fish. That the first proposition is not correct we have seen. The voluntary gleams would probably be emitted under one of the following conditions; 1. During the breeding season; 2. On capturing prey; 3. In escaping from enemies.

The spots are so conspicuous and invariable in outward appearance at all seasons and in both sexes that it is not probable that these organs were developed to attract the other sex.

Under the second condition no individuals have come under our observation; the only way in which the phosphorescence would be likely to aid in capturing prey would be by the attraction of other fishes by a continuous glow (*Stolephorus delicatissimus* was found in the stomach of one individual). If this were the case the individual watched should have shown this glow as it was not fed during confinement. A single flash, or successive flashes would more probably scare away fishes than attract them. The general distribution of the spots makes it improbable that they would serve to enable the fish to see its prey; the water above, beneath and on the sides of the fish would be pretty evenly illuminated.

There remains only the last condition suggested, which may, perhaps, be discarded with the statement already made, that all attempts at irritation failed to give any flashes. It may be stated in this connection that the fishermen here have not seen any phosphorescence from these fishes when capturing them.

What the function of the spots may be we are unable to say. Aquarium facilities for making extensive and long-continued observations are, at present, wanting. Further observations will be made as soon as practicable.

A description of the spots is not necessary here as their posi-

tion and external appearance have been well described by Jordan and Gilbert in their Synopsis of N. A. Fishes, and their minute structure is the subject of a paper in press by Mr. Frederick C. Test.

Carl H. Eigenmann and Rosa S. Eigenmann.

SAN DIEGO BIOLOGICAL LABORATORY, April 1, 1889.

COLORADO NOTES.

A form of *pisidium pusillum*, a minute fresh-water bivalve, is reported from Delta county.

Among the fifteen species of liverworts known to Colorado is *Marchantia polymorpha*, which is reported as being exceedingly abundant on the banks of streams on the east slope of the Sangre de Cristo range in Custer county.

A perfectly black example of the black-tailed deer has been reported from Piney river, and it is said that an albino was found some years ago near Canon city.

Wolverines have lately been reported as occurring in Gilpin and Eagle counties.

The wild mountain goat is said to have formerly existed in Middle Park.

The common harebell (*campanula rotundifolia*), although of a deep blue color, often turns white in the process of drying for the herbarium. There is, however, a white variety, and a most curious fact, first observed by Mrs. M. E. Cusack, is that the flowers of this variety turn blue in drying.

All observant people must have seen the yellow spiders on yellow flowers, and white spiders on white flowers, that catch bees and other insects which visit the flowers—not noticing their enemies because of their deceptive coloring. These spiders live by their looks, and never go to the trouble of spinning a web. James Angus considers that these white and yellow spiders belong to the same species, and that they can change their color according to the flower they select.

The bulbs of *Calochortus* are frequently destroyed by an orange-colored maggot, which feeds upon them.

The mountain rat (*neotoma cinerea*) is troublesome in western Custer county, from about 8,400 feet to 10,000 feet altitude.

Some snails collected at West Cliff are identified by C. F. Ancey as *Pupa hebes*, *P. ingersolli*, *Vallonia n. sp.*, *Physa n. sp.* (?).

Among the animals now known to exist in Colorado are forty species of mammals and five varieties; three hundred and fifteen species of birds and forty-seven varieties; four species of reptiles; two species of fish; fifty-six species and eleven varieties of mollusca; four hundred and seventy-six species and twelve va-

rieties of coleoptera; one hundred and eighty-six species and twenty-seven varieties of butterflies; five hundred and seventy-three species and four varieties of moths; ten crustaceans; thirty-four species of arachnida (spiders, etc.); and the other classes of invertebrates are well represented.

BRIEFER ARTICLES.

PROTECTIVE COLORING.—I made a little experiment lately with some larvæ of *vanessa urtiæ*. They were placed in a rose arbor, of course in the shade; the chrysalids were nearly black, with but little gold marking. I then removed the remaining caterpillars in the cage to my greenhouse and the chrysalids produced were very light, pinkish, and freely marked with gold—the different light apparently causing this difference in the tint.

J. Jenner Weir

BECKENHAM, ENGLAND, in Report C. B. A.

COLORS IN PLANT LIFE.—I have often meant to ask whether you have ever noticed that in gooseberry bushes which bear yellow fruit the leaves turn yellow in autumn, and in those which bear red berries the leaves turn red. I have noticed this, and wondered whether there was any reason for it. Another observation of mine is that at different periods of the year there is generally a predominant color among wild flowers, or so it seemed to me at Ewhurst. For instance, first, I think, comes a yellow period—primroses, lesser celandine, tussilago, etc.; then a purple or lilac period—wistaria, lilac, purple orchids, etc.; next, a red period—ragged robin, rose, campion, and geranium. I am not quite sure where the others come, but think the year winds up with yellow again. Does this seem to you mere fancy? Of course there are always other colors at the same time, but in fewer numbers.

Miss A. S. Fenn.

ISLEWORTH, ENGLAND, in Report C. B. A.

THE WHISTLING TREE.—*Acacia fistula* grows in dense groves in Nubia and is known among the natives as the 'whistling tree.' It owes its name to the fact that a gall insect selects for the site of its operations the ivory white shoots, which the development of the larva distorts and causes to swell at the base into a bladder-like gall, about an inch in diameter. The insect, upon emerging, leaves a circular hole, and the wind playing upon the shoot is said then to produce a flute-like sound.

Amateur Collector.

MOSS MARBLE.—There has been discovered, four miles south of Rattlesnake springs, Washington Territory, an extensive ledge of marble, in which beautiful trees or plants of moss are as frequent and as clearly defined as in the moss agate, though the marble is not translucent. The body of the stone is mostly white, with splotches of pink and blue between the bunches of moss.

BIBLIOGRAPHY.

A. BLYTT. On variations of climate in the course of time. Christiania Videnskabs-Selskabs Forhandling, 1886, No. 8. The probable cause of the displacement of beach-lines; an attempt to compute geological epochs. l. c., 1889, No. 1. From the author.

LIFE-LORE. 4 Essex street, Strand, London, W. C., Vol. 1, No. 8, February, 1889. An excellent monthly magazine, full of things interesting to the naturalist, especially adapted in style, like our American *Swiss Cross*, to interest the young student.

R. W. SHUFELDT. The Navajo Tanner, Proc. U. S. Nat. Mus., XI; 59-66 (with six plates). An interesting account of the process of tanning and preparing of buckskin practiced among the Navajos, as performed directly under the author's personal observation by an Indian at Fort Wingate, New Mexico.

JAS. G. STEELE. Notes on California medicinal plants. Pharm. Rec., IX, 7-8.

THE JOURNAL OF MYCOLOGY. It is announced that this magazine will be issued quarterly during 1889, edited under the direction of the Commissioner of Agriculture, and distributed free to all the present subscribers.

C. E. BESSEY. A few notable weeds of the Nebraska plains. American Nat'l., XXII, 1114-1117.

BULLETIN from the laboratories of natural history of the State University of Iowa. Vol. 1, No. 1, Iowa City, November 1888. A valuable contribution to the natural history of Iowa. The principal papers are by S. Calvin, on geology; T. H. McBride, on botany; B. Shimek, on mollusca; and H. F. Wickman, on coleoptera.

THE CENTURY MAGAZINE, April. This is issued as the centennial number of Washington's inauguration. 'Some aspects of the Samoan question,' by Geo. H. Bates, is of especial interest at this time.

THE NAUTILUS. A monthly journal of conchology is announced to take the place of the *Conchologist's Exchange*, with H. A. Pilsbury as editor.

W. H. EDWARDS. The Preparatory Stages of *Colias meadii* Canad. Entom., March, 1889. In this paper the egg, larva in all its stages, and pupa are described with the author's customary precision. The larva is darker than any other *Colias* larva known to Mr. Edwards. The locality given (p. 42) as 'Marshall Peak' should be Marshall Pass. T. D. A. C.

JAMES CASSIDY. Notes on Insects and Insecticides. (Bull. 6, Agricultural Exper. Stn., Fort Collins, Colorado, January, 1889.) In this twenty-four page bulletin, Prof. Cassidy gives

interesting details about many species of injurious insects found in Colorado in 1888. Several appear to have been very recently introduced into Colorado, and this suggests the enquiry whether the Exper. Station itself may not be unwittingly bringing insect pests on imported shrubs and herbs, which would never otherwise cross the arid plains to the east of Colorado. *Pieris rapæ* is said to have established itself in Colorado, although Prof. Cassidy's description does not read like *rapæ*; *sesia tipuliformis* is another presumed introduction. Among insecticides; powdered veratrum albrem is recommended. We wonder whether the *V. californicum* (called albrem by Watson), which is common in parts of Colorado, would suffice in its stead? The report is unfortunately marred by several misprints in the spelling of scientific names, but altogether, is both interesting and valuable.

T. D. A. C.

T. D. A. COCKERELL. Preliminary remarks on the Molluscan Fauna of Colorado. 'Journal of Conchology,' Vol. VI, 1889, pp. 60-64. A preliminary survey of the Mollusca of Colorado, several species are added to the State list, and a new species of *Physa* is described.

FORCE AND ENERGY. A Theory of Dynamics; by Grant Allen. Humboldt Publishing Company, 24 East 4th street, New York. The author defines Force and Energy as the two manifestations of power, tending to initiate aggregative motion, finding its expression in gravitation, adhesion, chemical affinity, and imperfectly comprehended electrical affinity, and showing its vitality in the separative powers classified as molar, molecular, chemical and electrical modes or manifestations of motion.

EDITORIAL.

The lichens collected by the editor have been placed in the hands of a specialist, who will carefully identify them and publish the results of his studies in this magazine. The duplicate sets of these lichens will be offered for sale or in exchange and distributed whenever a fascicle may be prepared. Those desiring the more complete sets should apply at once, as many, likely the new and rarest species, were sparingly collected. We should be pleased to have collections of lichens from any of our West American correspondents to include in our own series and for distribution. We enjoyed recently a pleasant visit from Dr. C. C. Parry, who is again on the Coast, persistently following up his acquaintance with some of our equally modest and retiring wild flowers. A new species of *eriogonum*, of which our readers will learn more soon, rewarded his search through our herbarium. Our Colorado notes are selected from the reports of the Colorado Biological Association, prepared by the Secretary and

published in a local newspaper. 'The Digger's Duff,' given in one of our Australian exchanges, has been adapted to this country and may be appreciated by some of the miners returning from the Lower Californian placers. The rich discoveries that caused the recent excitement and exaggerated reports, proved very limited in extent, but many evidently find enough to keep up their courage. Other discoveries will surely reward the patient prospector, and the discovery of many valuable quartz veins containing gold have already resulted from the prospecting. We would suggest that descriptions of new species or varieties, whenever possible, should be accompanied by a type specimen for preservation in our West American Museum of Nature and Art, which already contains type specimens of many species. We desire to make it especially complete as regards the fauna and flora of the Western States. 'The Desert in June,' gives the botanical aspects of an uninviting region at the most desolate season of the year (in that section). We hope to give our readers a different picture of the same region soon, as it appears after abundant rains, when it is literally transformed into a garden full of the choicest flowers.

NOTES AND NEWS.

Seeds of the most valuable varieties of cinchona bring \$1,000 per ounce in Ceylon. There are nearly 100,000 seeds in an ounce.

It has been computed that the great smoke cloud daily hanging over the city of London contains fifty tons of solid carbon and 250 tons of hydrocarbon and carbonic oxide gases. This waste would be valued at \$10,000,000 per annum.

St. Nicholas for April figures and describes the largest egg in the world, laid by *Aepyornis maximus*, the largest bird ever known to exist. This bird, a relative of the ostrich, although much larger, towering above the tallest giraffe, was practically wingless and a swift runner. It formerly inhabited Madagascar, and is now extinct. The eggs sometimes measured over three feet the largest way around, two feet six inches around the middle, and held eight quarts of meat (equal to 140 hen's eggs!), with a shell at least half an inch thick, nearly six times the size of an ostrich egg! Only one complete egg, in the Jardine des Plantes, Paris, is known to exist.

Stachys tuberifera, a native of North Africa, comes to this country from Japan where it is called *Chiro-Gi*. This new vegetable has lately attracted considerable attention in Europe and this country. It yields edible tuberous roots, which boiled and seasoned in the way of the egg plant, become a novel dish, having a pleasant and somewhat spicy flavor, midway between the Jerusalem artichoke and boiled chestnuts.

One tree of *Psiadia rotundifolia* on the island of St. Helena, seems to be perfectly alone in the world—the last of its race. It is about twenty feet high, formerly common on the island, forming large groves, but the woodman's axe and the ravages of goats have left only this single specimen. It is the only known tree of the Compositæ, a family which, with this exception, comprises only herbaceous plants.

Flowers of the magnificent *Romneya Coulteri*, in cultivation in San Diego, have been measured that were nine inches across. This is one of the finest of the native plants of Southern California.

A Swede claims to be able to convert wood into stone, but the present cost is about \$500 per cubic inch.

A German scientist forces oil into the pores of soft wood, then subjects it to intense pressure, thereby solidifying it, rendering it as good as *lignum vitæ* for such purposes as stern bearings for propeller shafts, etc.

The electrical process of refining sugar turns out to be a swindle of gigantic proportions.

Sir James Hector maintains that the chief use of the antlers is not for fighting so much as for facilitating the progress of the stag through dense woods. In his experience with the elk he finds that by throwing up the head, thereby placing the horns along the back, the animals were enabled to go forward with great rapidity and follow the hinds. The experience of others in India and New Zealand seems to confirm this view.

An ornithologist and oölogist's directory is being compiled by Messrs. Menefee and Corless, of San Jose, California, who desire the names and addresses of every student and collector to render their work complete.

The California State Fruit Growers' eleventh session convened at National City on April 16, 17, 18, and 19.

The tin mines of Dakota are now considered beyond doubt of immense value, and it is expected that English capitalists will soon take steps toward their development.

Pueblo, Colorado, has decided to erect a mineral palace, 300x200 feet, constructed of heavy timbers entirely concealed inside and outside by minerals, especially iron, coal, copper, galena, coke and manufactures of iron and steel. Within, it is hoped to have specimens from every gold and silver mine of any importance in the United States and Mexico.

Gold has been recently reported as having been found in several provinces of Japan.

At the last summer fair of Irbit, which is a market for only a part of the furs exported from Siberia, skins of 3,180,000 squirrels, 11,000 blue foxes, 140,000 marmots, 30,000 polecats, 10,000 badgers, 1,300,000 hares and 2,000 foxes, were offered for sale.

The product of crude petroleum in California during 1888 is estimated at 300,000 barrels of forty two gallons each.

The famous Temescal tin mine, of Southern California, has been purchased by an English syndicate. There are fifty-three ledges of tin ore on the property secured by the syndicate, which can supply the entire coast with all the tin consumed, as the supply of ore is said to be inexhaustible and the quality of the tin that can be produced is of the very best.

There are as many Indians in the State of New York as in Minnesota--about 500.

Physicians of Paris have condemned the use of saccharine as a food, and find that its antiseptic qualities render indigestive, whatever food it is mixed with.

A spring of natural cologne has broken out in the southern part of Algiers, it is said.

Ventriloquial powers which they sometimes use to their advantage, have been detected in some birds, especially sparrows, thrushes, and robins, by Ernest E. Thompson of Canada.

The greenish color of some of the sloths is attributed to the presence of an alga upon the hair. Two genera and three species of these parasitic plants have been recently described. The new genus, *tricophilus*, is green, the other, *cyanoderma*, with its two species is violet. From 150,000 to 200,000 individuals of these algæ may occur upon a single hair.

The number of wolves killed in France in 1888 was 701, for which nearly \$10,000 were paid in bounties by the government. The French wolf is shy, and does not scour the country in bands, like the Russian kind. The peasants say it quite understands that there is a price set on its head, and so keeps out of their way, and it is only in very hard winters that it leaves the forests to attack flocks. Only two, of the 701 killed, had attacked human beings.

Dr. Carl Zeiss, the world-famed optician, whose death at the age of seventy-three years has been recently announced, was especially successful in the manufacture of microscopical lenses possessing unusually long focal distances. His simple microscopes early became famous on account of their extraordinary wide apertures, and hence their resolving power was almost relatively unequalled even by the compound instruments then in existence.

Oxytropis lagapus, Nutt., is reported from Augusta, Montana, as a 'loco' or 'rattle weed,' credited with being the cause of killing horses. F. D. Kelsey (Bot. Gaz., XIV: 20) doubts that this is the plant that does the mischief. In Southern California several species of *astragalus* have the same unenviable names and reputation, while in Arizona, we have been informed, species of *oxytropis* and *hosackia* respectively share the blame. The subject is worthy of the attention of the Department of Agriculture.

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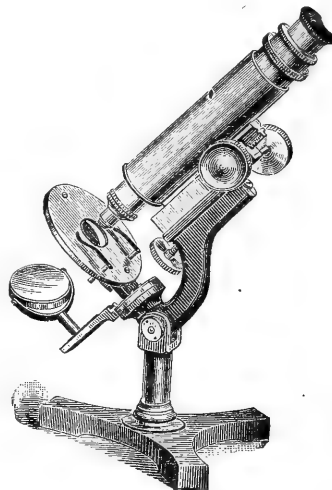
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THE WEST AMERICAN SCIENTIST.

VOL. VI.

JUNE, 1889.

No. 44

SOME NATIVE FORAGE PLANTS OF SOUTHERN CALIFORNIA.

One would scarcely look at the Colorado desert to furnish any valuable additions to the list of forage plants. The value of the mesquite and allied trees has been mentioned in a former paper, but we now have to treat of other plants which have borne the test for over three years.

A portion of the month of April this year was spent on the borders of this desert, where we were fortunate in making the acquaintance of Mr. Marion D. Haydon, whose hospitality we enjoyed for several days. From this reliable observer we learned many interesting facts, especially concerning the following plants, which information may prove of great economic value in the arid portions of the west.

ALFILARIA.

Alfilaria (*Erodium cicutarium*, L'Her.) was found abundantly around Mr. Haydon's desert ranch, which is located on the edge of a sandy plain, surrounded by granite hills on several sides and locally known as the Dos Cabezas from two high rocks above the spring resembling human heads in their general contour. He had a small band of horses and cattle which he proposed to pasture all of this summer on the surrounding plains. To a stranger the alfilaria might seem to have been the only food obtainable by the cattle. While at this season it was doubtless relished by the stock better than anything else, yet it will be seen later that it was not the only available forage. Eight years ago not a plant of alfilaria was to be seen growing on this desert where now it is so abundant. It made its first appearance on the desert slope at about that time around the old stage station at Mountain Springs, where it is now luxuriant. *Erodium moschatum* was not observed, although near the coast it is usually mixed with the other species, especially in moist valley land. It will be seen how easily the alfilaria may have been introduced from Europe and have spread so rapidly as to be now considered by some as actually indigenous to our country.

"GIETTA" GRASS.

Only one true grass was found growing on these sandy plains of the desert, although a few others grew among the rocks in the canyons. This grass is *Hilaria rigida*, known to the ranchmen

in the mountains as the "gietta" grass—a name furnished by the Mexicans, the true spelling of which I was unable to determine. It grows abundantly on the open plain to a height of one to two feet, forming dense bunches which are, however, rather scattering as a rule. It seemed to delight in the finest sand that was apparently free (at the surface) from all foreign substances and where no other plants could be found growing. I easily cut it for my horses with a pick, and could with this implement form quite a bale in a few minutes. As its specific name indicates, it is a rigid, unbending grass which will break sooner than yield. The large amount of starch embodied in its stalks may be considered to account for this stiff nature which it possesses. For several years Mr. Haydon has cut this grass for hay, and fed it to his horses and cattle, with satisfactory results. Horses soon learn its good qualities in spite of its rather discouraging stiffness.

DEER WEED.

Another plant extending through our hills and mountains from the sea shore to the sandy plains of the desert, where it is equally abundant with the last, is the deer weed (*Hosackia glabra*). Each plant forms a dense spreading bush, one to three feet high, bearing a profusion of small yellow flowers followed by small pods. It belongs to the pea family and nearly related to the alfalfa and clovers. It grows in dry situations, among the brush on our driest mesas and on the open plains of the Colorado desert, where it blossoms in April and ripens fit to cut by June. Its name among the mountains indicates that it is a favorite with deer, but its value might not have been suspected, except for the necessity of using everything available when on the desert. Mr. Haydon was probably the first to utilize it, having cut it for hay for three years, and reports it as fattening for stock, and good, strong forage. The plant in bloom also supplies an excellent pasture for bees.

FRANSERIA.

A little boy in Nevada, writing to the editor of the *Swiss Cross*, say of the sage brush: "When cattle can get nothing else, they eat the young shoots." We would suppose that no horse or cow, in the presence of other food, would touch the allied *Franseria dumosa*, a common bush among the hills bordering the Colorado desert, and extending also over a large portion of the plains. It is very bitter, usually stiff and dry—but quickly reviving after a little shower. Still we are informed by Mr. Haydon that this forms one of the most valuable of the native plants, and that without having learned its value he could not have explored the desert as he has done. It is a strong, healthy food, and horses acquire a taste for the burr-like fruit, which it produces in abundance.

C. R. Orcutt.

HIS PRAISE.

Even the desert hath a flower,
His praise to offer up,
Who fashioned it in beauty there,
And filled its fragrant cup.

Even the desert hath a flower,
A lily formed to breathe
His praise upon the glowing air,
Sweetly at morn and eve.

And o'er it bends the starry night,
And from the distant sea,
From beaming star and throbbing wave,
His praise makes melody.

And yet the little desert flower,
As far as in it lies,
His praise and glory spreads abroad
As much as seas and skies !

E. E. Orcutt.

AN INDIAN MYTH.

In approaching the confines of the Colorado desert this spring, we found a snake story in circulation among the mountain men that surpassed any similar tale that had reached my ears, and which in one sense is worthy of record. The story or myth seemed to lose nothing in being repeated, and the two rattlesnakes—the subject of the myth—had reached the final length of “forty feet and were still growing” when last heard from !

The Indian myth, from the first narrator (as given to him by the Indians themselves) is substantially as follows: Two immense rattlesnakes, measuring from sixteen to seventeen feet in length, inhabit a cave in a rocky mountain on the desert, known as the “mysterious mountain.” This mountain is partially (and at times wholly) covered by drifts of sand which are formed and whirled on the mountain by the wind storms frequent in that region. For eight years the mouth of this cave where the rattlesnakes live has been stopped by sand, which has now been blown away, so that the snakes are virtually on “free exhibition,” and, it is said, will not offer to disturb any one who may wish to visit them. But if any one offers to disturb their majesties, the snakes will begin to rattle furiously and raise a terrific sandstorm on the mountain that will bury the disturber of their peace in sand.

After the victim has been thus suffocated, the sand will be again blown away, exposing him for the delectation of their palate. No Indian will venture to show the cave to a white man without he agrees not to offer to disturb these snakes, and some

say that the snakes feed only on human beings—those only, who from cupidity or malice, attempt to disturb them.

At the base of the mountain a large Indian burying ground is said to exist. Upon a death in a camp the body would be placed in the sand, and then a large and heavy stone would be placed on the dead person's breast. After that every relative or friend would break an olla on the stone, thus forming a mound of broken pottery to mark the spot, and to prevent either coyotes or the strong winds from exhuming the body. The largest of these cemeteries is reported as about one hundred feet in circumference. These Indian tribes have now virtually passed away, and to-day the places which knew them is an uninhabited waste of sand.

C. R. Orcutt.

CONTRIBUTIONS FROM THE SAN DIEGO BIOLOGICAL LABORATORY.

ISESTHES GILBERTI JORDAN.—The eggs of this species are quite remarkable in structure and coloration. To the unaided eye they appear opaque, of a purplish pink, inside which is a spot of brownish red and upon this a dot of white. The greater portion of the egg is covered by a simple thin, transparent membrane, but at one pole of the egg the membrane is provided with a white cushiony cap formed of numerous filaments which are slightly thickened at their tips and woven together at their free ends. In the small size of these filaments, their great number and aggregation at one pole, they differ from all other appendages of fish eggs yet described. The egg fastens itself to foreign bodies by means of this cushion; when once fastened the egg becomes depressed, the longer and shorter axis measuring .8 and .5 mm. respectively. The yolk is composed of rather large spheres; on its upper surface are imbedded an equal number of pale yellow and bright purple oil globules, in the midst of which is the white body referred to above. Younger ovarian eggs are entirely purple, while still younger ones are colorless. The germinal disk invariably lies beneath the cushiony cap, whether the cap lies above, below or at one side of the egg. The relative specific gravity has, in this case therefore, nothing to do with the position of the germinal disk.

The first segmentation is completed in about ten hours and results in much elongated elliptical cells. Most of the stages are obscured by the peculiar cap. After one hundred and thirty-two hours the eyes are well formed and the embryo embraces about one-half the yolk; several pigment cells are formed on the yolk at this time. On the seventh day the heart beats slowly, the pigment spots have increased considerably and the embryo has become independent of the "cap." The embryos were kept sixteen days when they died.

OLIGOCOTTUS ANALIS GIRARD inhabits rocky pools on the ocean beaches about San Diego. Its eggs, like those of many other cottoids, are glued together as they are extruded from the ovarian duct. The spawning period of this species probably extends from January to April. The egg measures 1.2 mm., is of a brownish-yellow color and has one large, and from five to nine smaller oil globules. The egg is surrounded by a thick zona, which appears to be perforated by two sets of canals—the usual fine ones and fewer, much coarser canals. In optical section, the latter appear as black lines. The eggs hatched in from eighteen to twenty-four days, under seemingly identical conditions. The following peculiar pigmentation distinguishes this species on hatching; a pigment cell above each eye, that over the left eye always larger; a group of pigment cells on the nape, the upper two being somewhat removed from the rest, a broad black shield of pigment cells overlying the body cavity; about thirty-four pigment cells along the lower margin of the tail.

MICROMETRUS AGGREGATUS GIBBONS.—In dissecting the ovaries of this species, nodules in the ovarian stroma, were repeatedly observed, which were much larger than the ripe eggs of 2m m. diameter. On sectioning these nodules, they were found to be eggs, much larger than the normal size, measuring .5 mm. in diameter. From the fact that the young of these fishes remain in the ovary from four to five months and are abundantly supplied with food from the time of hatching to the time of leaving the ovary, it may be inferred that a great amount of food is not needed in the egg, and that the eggs are consequently reduced to a minimum size. The comparatively frequent presence of the larger eggs suggests that they are a reversion to a condition when these fishes were oviparous and required more yolk. The nucleus in the larger eggs does not differ in size from that of the smaller, the increase in size being entirely restricted to the food portion of the egg, another fact tending to prove that the smaller eggs have been reduced from formerly larger eggs.

STOLEPHORUS.—There are three species of this genus found in San Diego Bay; *ringens*, *compressus* and *delicatissimus*. In May, great numbers of *Stolephori* which are probably the young of *ringens*, are swarming in the bay and are especially abundant near the wharf of the Pacific Coast S. S. Company, the eggs of the first and last of these species are oval in shape and pelagic. Slightly oval pelagic eggs have been recorded before, but none in which the longer axis is so strikingly greater than the shorter. We have detected three sizes, having the longer axis to the shorter as 7 to 5, as 8 to 4, and as 8 to 5. As variations between the last two are found in great abundance, they probably are identical. The germ for obviously mechanical reasons always collects at one end of the longer axis, most probably the micropylar end. If this is so, these eggs will serve well to study the relation of the

animal pole of the ovum to the ovary. The eggs can be collected in great numbers in April and May, but we have not succeeded in finding more than two or three eggs in which the gastrula did not cover at least half of the yolk. The eggs are deposited in the evening, just where we have not been able to find. The later stages are abundant about the P. C. S. S. Co's. wharf. The yolk is collected in large masses and is perfectly transparent. The embryos hatch in two days. We have succeeded in keeping the fishes two days after hatching. At this time the yolk is nearly absorbed.

TYPHLOGOBINS CALIFORNIENSIS STEINDACHNER.—This is the most remarkable of the fishes found at San Diego. It is very abundant under large rocks, on the southern shore of Point Loma. It lives in the holes made by a Carideoid crustacean, with which it is usually found associated. It is very tenacious of life and many individuals were kept in confinement several months. Some which were gradually placed in fresh water, remained active for a week, when they began to swell. On being again transferred into salt water all but one survived. They frequently swim (in confinement) at the surface of the water, back down, their ventrals using the surface of the water as a plane for attachment. The fully grown individuals are entirely destitute of vision and seem merely to have an uncomfortable feeling in direct sunlight. Ordinarily they will hide under transparent objects as readily as under a dark one. A test tube which was accidentally placed in a vessel containing them was completely filled with them. In individuals four centimeters long, the eyes are not covered by so thick a layer of epidermis and they can see some distance in front of them. Any object thrust in front of smaller ones usually causes them to turn when the object is about three centimeters from their eyes, while it does not disturb the larger ones. The eye is very small, the crystalline lense comparatively large. The optic nerve is extremely thin, but has been traced to the brain, both by maceration and by dissection. There seems to be no difference in the structure of the visual organs between the smallest and largest individuals. The early stages have not been observed, but we doubtless are here dealing with a case of retardation rather than of degeneration.

The eggs of this species present some thoroughly new features. Several females spawned while in confinement, but did not develop. The eggs are oval. They are surrounded by the usual zona radiata and a *network of threads*. The meshes of this net are coarsest near the vegetable pole of the egg and finer toward the animal pole, near which they form a second membrane, perforated by a few holes only. This *network of threads is attached to the zona radiata around the micropylar region*. This condition is approached most nearly in *osmeus eperlanus*, where a second

membrane seems to bear the same relation to the zona, as the network of filaments does in this case. Before the eggs are deposited, this net work is stripped off the egg and forms a strand. The strands of different eggs serve to bind them together. The eggs thus come to be laid in clusters resembling bunches of grapes. The yolk is bright lemon yellow, the germ granular and opaque white. There are many oil globules imbedded in the yolk. On comparing these eggs with those of the crustacean, with which they associate and whose eggs are deposited at the same date, they are found to resemble them to a marked degree, and the thought naturally suggests itself that the first eggs mimic those of the crustaceans. In many cases, when for some reason or other, the eggs were injured they expanded greatly in the direction of their long axes, so that they became canoe-shaped, measuring in one case .8x1.8mm.

Carl H. & Rosa S. Eigenmann.

*LIST OF BEETLES OF THE GENUS AMARA
TAKEN RECENTLY IN COLORADO.*

(Compiled from the Record Book of the Colorado Biological Association.)

For the identification of the species here enumerated the association is indebted to Dr. John Hamilton, Prof. C. V. Riley and the U. S. National Museum.

Amara polita, Lec., Custer Co., Wet Mountain Valley.

Amara confusa, Lec., W. Custer Co., W. Fremont Co.

Amara n. sp., Fremont Co., W. Custer Co.

Amara musculus, Say, W. Custer Co.

Amara terrestris, Lec., W. Custer Co., Fremont Co., Canyon City, N. E. Mesa Co.

Amara cylindrica, Lec.?, W. Custer Co.

Amara interstitialis, Dej., Summit Co., Slate Creek, W. Custer Co., Pueblo Co.

Amara fallax, Lec., S. Pueblo Co.

Amara erratica, "Sturm" var., W. Custer Co.

Amara laticollis, Lec., W. Custer Co.

Amara remotistriata, Dej., E. Montrose Co.

Amara gibba, Lec.?, W. Fremont Co.

Amara obesa, Say, W. Custer Co.

Amara aenea, W. Custer Co. near Ula.

Amara latior, W. Custer Co.

T. D. A. Cockerell.

WEST CLIFF, COLO., May 16, 1889.

HOURS FOR VISITORS TO THE LICK OBSERVATORY.

The Observatory buildings will be open to visitors during office hours, every day in the year. Upon their arrival, visitors will please go at once to the visitor's room and register their names.

An hour or so can be profitably occupied in viewing the various instruments, and the rest of the stay can be well spent in walks to the various reservoirs, from which magnificent views of the surrounding country can be had. At least an hour and a half of daylight should be allowed for the drive from the Summit to Smith Creek. *There are no hotel-accommodations at the Summit.*

For the present, visitors will be received at the Observatory to look through the great telescope every Saturday night, between the hours of 7 and 10, and *at these times only.*

Whenever the work of the Observator will allow, other telescopes will also be put at the disposition of visitors on Saturdays between the same hours (only).

At 10 P. M. the Observatory will be closed to visitors, who should provide their own conveyance to Smith Creek, as there is no way of lodging them on the mountain.

It is expected by setting apart these times for visitors (which allow freer access to the Lick Observatory than is allowed to any other observatory in the world) that all interested may be able to arrange their visits in conformity to them; and that the remaining hours of the week will be kept entirely uninterrupted, in order that the Astronomers may do the work upon which the reputation and the good name of the Observatory entirely depends.—*Edward S. Holden, Director.*

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

SAN FRANCISCO MICROSCOPICAL SOCIETY—APRIL 10, 1889. Mr. A. B. Leckenby spoke briefly of the difficulties often experienced by the tyro in manipulating the numerous forms of insect life for slide-mounting and lantern projection, and described the method pursued by him as embodying the result of many years of patient application to the subject. Starting with the coleoptera, or beetle family, the first step is to devitalize them quickly and while they are in flight, which the gentleman accomplishes by dropping them through a long glass tube into boiling water. The elytra and wings are by this means immovably fixed in the extended position, and remain unaltered during the subsequent operations. The body of the insect is then injected hypodermically with a strong solution of caustic potash and allowed to remain three or four hours, then transferred to a glass slip and gentle pressure applied, when the viscera and other tissues form-

ing the interior of the body will be expelled. To dehydrate or remove the watery portion, absolute alcohol is generally recommended, but the lecturer contended that it was expensive and not always at hand, while equally good results would follow by placing an ounce or two of refined gelatine in a vessel, pouring on alcohol of 95 per cent. and immersing the object for a short time—the gelatine, from its affinity for water absorbing that fluid from both the object and alcohol.

The insect is then placed in oil of cloves to clear or render it transparent, and is ready for mounting permanently in balsam. By this method, the insect is rendered entirely transparent, the peculiar geometrical markings of the wings, the abdominal and thoracic rings and the various parts forming the head and limbs, are beautifully displayed.

In preparing the Lepidoptera, a somewhat different course is pursued, as the wings of all butterflies and moths, being covered with easily detached scales, must be protected. The butterfly or moth is placed on a square of glass and liquid paraffine flowed carefully over the entire insect. After cooling, a small aperture is made, exposing a portion of the body and caustic potash injected; the subsequent operations being the same as for beetles, excepting that sulphuric ether must be used to dissolve off the paraffine, leaving the soft velvety covering of the wings unimpaired.

In this manner are prepared the beetles, dragon-flies, bees, wasps, caterpillars, etc., and when mounted in balsam, they form some of the most beautiful and instructive objects imaginable whether viewed through the microscope or projected on the screen. Mr. Leckenby exhibited many fine specimens of his handiness in preparing and mounting the different orders of the insect world, noticeable among which were a gigantic tarantula, several gorgeous Papilios, fierce-looking dragon-flies, beetles, wasps and a large collection of small objects.

APRIL 24, 1889.—A fine series of photographs was exhibited, containing some graphic enlargements on the new Eastman bromide paper. This process of enlarging on bromide paper produces excellent results, the effect when exposure and negatives are properly manipulated being almost equal to steel engravings. Examples were shown of *Pleurosigma Angulatum* the negatives of which were taken at a magnification of sixteen hundred diameters.

The bromide process commends itself to those interested in photomicrography by its simplicity compared with the tedious work of printing from silver paper.

Mr. Lickenby concluded his practical demonstration of preparing and mounting insects in balsam. It is quite difficult in preparing many of the smaller forms of insects to remove the de-

bris from the surface of the specimen without injuring the delicate portions. This the gentleman accomplished by the aid of albumen, flowing the white of an egg over the object and immersing the slide in hot water till the albumen is coagulated, when it will generally crack open and may be removed in two portions carrying with it all the foreign matter and leaving the surface of the specimen perfectly clean. Another thing strongly advocated is thorough washing of the objects in running water and a final rinsing in either filtered or distilled water before placing in alcohol.

In mounting, the insect is placed under the cover glass arranged in proper shape, the clearing solution applied, and when sufficiently transparent the oil of cloves is drained away and Canada balsam introduced at one edge of the cover glass, the slide being held over the flame of a lamp to gently warm the balsam and allow it to flow in and displace the remaining oil of cloves. No annoyance need be felt at the presence of bubbles of air, as they all will gradually disappear. The mount, when filled with balsam, is placed in a warm oven or incubator and kept at a temperature of from 120° to 130° Fahrenheit for twenty-four hours, when the balsam will be thoroughly hardened and all the air bubbles driven out.

Mr. Lickenby does not advocate the use of volatile solvents with balsam, he being convinced that a certain amount of gas is always retained in the mount in a latent state, requiring only a slight amount of heat to produce bubbles and disfigure the specimen. The outer skeleton of insects is composed of a substance called *chitine*, which is quite unique in its chemical composition. It appears to be, within certain limits, very resistant to acids and alkalis, and it is owing to this fact that caustic potash can be used in such varying proportions in treating them for microscopical study. It is said, however, that *chitine* succumbs to the action of chlorine compounds, which would render that substance unfit for use in bleaching many of the delicate forms.

MAY 8, 1889.—The microscope has scored another point in bringing to light the hidden treasurers of the Golden State. Among the visitors present were A. W. Craig and W. E. Brainbridge. The latter gentleman gave a good description and exhibited samples of a remarkable find located by him in Ventura county, near the head of the Sespe river. It consists of what is called "gem sand", which, when examined with a power of about fifty diameters, is seen to consist largely of garnets, zirconite and what parties to whom the material was submitted in the Eastern States pronounced to be diamonds.

The gems, to be sure are small, appearing only the size of a rape seed when magnified fifty diameters, but the presence of such quantities of minute stones surely indicates the existence of larger members of the same family.

Mr. Brainbridge remarked that he had no doubt thrown away numbers of the larger stones, thinking them loose quartz crystals, as he was only panning out the sand to find gold or large garnets.

Professor Hanks stated that the small stones, said to be diamonds, had all the characteristics of a California diamond, and his opinion is worthy of attention, as he has made a close study of the gem.

The metal platinum is also present in this sand, but whether in quantity sufficient to make it of commercial importance, has not yet been ascertained.

The zirconite occurs in square prisms with pyramidal terminations, and the stones are of a light-brown color and very transparent. Altogether, the discovery of Mr. Brainbridge is a remarkable one, and its future investigation will be watched with great interest. It might be mentioned that the sand, of which samples were shown last evening, extends over a space of one-half to three-quarters of a mile wide by several miles in length.

Mr. Wickson exhibited a peculiar entomological phenomenon—the common aphid attacked by the 'Fly cholera', *Empusa muscæ*. The gentlemen explained how the fungus spores lodge on, or become attached to the body of a fly, immediately commence growing and penetrate through the skin. Once inside, the spore rapidly increases by self-division, in the manner of yeast cells. The first stage of the disease is indicated by the restlessness of the attacked flies; they soon, however, became weak and slow in their motions. Having securely fastened themselves with their broad tongues to the object upon which they happened to be when attacked by the last stages of the disease, a succession of spasmodic tremors pass through their wings and legs and they stiffen themselves out to fly no more.

The abdomen of the victim of this disease, previously already swollen, becomes more and more distended, and a fatty, whitish substance pushes through the softer membranes between the chitinous rings or segments. Soon after a whitish halo of spores is formed around the dead body, readily seen, if the fly happens to have fastened to the glass of mirror or window-pane. These spores gradually cover the whole insect with a white dust and they appear in ever-increasing numbers as the body of the victim dries up, until at last its whole interior is empty and only a shell remains. From an examination of the affected aphid, there appeared no reason to doubt but that the fungus developed and ran its course the same as in the fly, their bodies being distended and surrounded with the white halo of filaments bearing ripe spores ready to be thrown off and carry on their work of inoculation.

It was suggested that here might be found a remedy for these annoying pests by systematically inoculating *Aphis colonies*

when existing epidemically, and Mr. Wickson stated that such a course had been spoken of, but could not say that it had ever been carried out. Unfortunately, the more destructive of the fruit and grain pests, do not seem to be seriously attacked by this fungus, although the chinch bug has an inveterate enemy in an allied fungus termed *Entomophthora*, which also carries off the larvæ of certain butterflies.—*C. P. Bates Recording Secretary.*

NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D. C.—APRIL 17, 1889.—Prof. Othaniel C. March was re-elected President, and Prof. S. P. Langley, Secretary of the Smithsonian Institution, elected Vice-president. After the election, the members of the Academy called on the President of the United States, at the White House

The papers presented at this meeting of the Academy were as follows:

On Composite Coronagraphy, by I. P. Todd; Memoir of Prof. S. F. Baird, by Dr. Billings; Memoir of Dr. Asa Gray, by Dr. W. G. Farlow; Determinations of Gravity, by Mr. C. S. Peirce; On the N. A. Probocidita, by Prof. E. D. Cope; On the Mass of Saturn, by M. A. Hall, Jr.; On the Nature and Composition of the Double Hallides, by Prof. Ira Remsen; On the Rate of Reduction of Nitre Compounds, by Prof. Ira Remsen; On Some Connection Between Taste and Chemical Composition, by Prof. Ira Remsen; Recent Researches in Atmospheric Electricity, by Prof. T. C. Mendenhall; Measurements by Light Waves, by Profs. A. A. Michelson and E. W. Morley; On the Feasibility of the Establishment of a Light Wave as the Ultimate Standard of Length, by Profs. Michelson and Morley; Additional Experimental Proof that the Relative Coefficient of Expansions Between Baily's Metal and Steel is Constantly Between the Limits of Zero and 95 Degrees of Temperature, by Prof. W. A. Rogers.

THE COLORADO BIOLOGICAL ASSOCIATION.—The recent election of officers has resulted as follows:—President, C. F. Morrison; Secretary, T. D. A. Cockerell; Treasurer, H. G. Smith, Jr.; Council, Dr. C. H. Merriam, H. W. Nash, Prof. A. S. Packard, D. W. Park, Prof. J. M. Coulter and D. Gale.

The membership is now sixty-three, the following having joined during the last six weeks: Dr. E. B. Landis, H. Todenwarth, J. Bentley, L. Stejneger, S. C. Cockerell, Prof. James Cassidy, Dr. D. O'Brine, Miss E. L. Morton, C. A. Cooper, Miss Alice Eastwood, B. T. Galloway and H. A. Pilsbry.

The additions to the fauna and flora of Colorado, as recorded in the books of the association, have been during April, 1889: Mammalia, 1; Birds, 1 var.; Reptiles, 3; Amphibia, 2; Fishes, 1; Mollusca, 2 vars. and 1 fossil species; Coleopter, 4; Hymenop-

tera, 749; Thysanura, 1 fossil; Phœnogamia 1 and 5 vars. and 2 fossil.

Among recent records entered in our books, the following are especially noteworthy:

Pityophis sayi mexicanus, Arapahoe Co., (H. G. Smith, named by L. Stejneger.)

Bufo lentiginosus woodhousei, Arapahoe Co., (H. G. Smith, named by L. Stejneger.)

Succinea lineata, Binney., Kremmling, Grand Co., (T. D. A. C., named by R. E. C. Stearns.)

Agabus morosus, Lec., West Cliff, Custer Co., (T. D. A. C. named by Dr. John Hamilton.)

Lachnosterna crinita, Burm., near Swift Creek, Custer Co. (T. D. A. C., named by Prof. C. V. Riley.)

Orchester minutus, near Swift Creek, Custer Co., above 8,000 ft. (T. D. A. C., named by Dr. J. Hamilton.)

Chrysomela montivagans, Willow Creek, Custer Co., 8,400 ft. alt. (T. D. A. C., named by Dr. J. Hamilton.)

Callidryas philea L., ♂, Arapahoe Co., (H. G. Smith, named by H. W. Nash.)

Crambus sericinellus, Tell., W. Custer Co., (T. D. A. C., named by Hy. Edwards.) *T. D. A. Cockerell, Secretary.*

WEST CLIFF, COLO., May 16, 1889.

BRIEFER ARTICLES.

THE LOCO WEED—The disease commonly termed loco among stock men, which especially affects the horses throughout the West, is one generally to be dreaded. It is usually ascribed to the diseased animal having fed upon some one of the many large species of *Astragalus* of which different species are found in different parts of our country. If eaten green the plants seem to have no injurious effect—at least not so noticeable—but eaten dry it soon proves fatal. A tea made from the *Astragalus* found in New Mexico, given in three doses of a pint each to an old but perfectly healthy horse, caused death in thirty eight hours, according to one man, whose veracity is, however, open to doubt. According to the same authority, an Indian mistook a bottle of the tea for whiskey, resulting in a rush of blood to the head and death in three hours. At Fort Whipple barracks, A. T., alfalfa hay mixed with the loco weed rendered the horses crazy and foolish, refusing to be led, and relief was only afforded by bleeding in the neck veins. But no evidence agreeing with the above yet known to have been placed on record, that is sufficient to convict any plant. Some have ascribed the loco disease to the presence of ticks in the horses ears, and their penetrating to the brain, but the symptoms do not seem to agree with the genuine "loco." This subject is worthy of careful study and investigation, and any further evidence or discussions are invited. *C. R. O.*

A THORNY PATH—This morning I found under a piece of cactus in a canyon a beautiful mottled shell of *Helix Stearnsiana*. The original tenent had not moved from this little home and I soon transferred both house and lodger to my basket. I added a few fungi, some other shells, and two or three plants of the fish hook cactus to the contents of the basket. In a short time I noticed that the snail was restless, and, after investigating the newspaper that lined the basket as well as the fungi, he found the cactus which was evidently a pleasant discovery to him. The heads of the cacti were closely set with clusters of fine white spines and larger central hooked spines which give the variety the name of the fish hook cactus. Carefully feeling his way, the snail ventured upon this sea of spines soon drawing his shell after him, and leisurely crossed the several heads over the needle points of the spines (on which the reader would doubtless hesitate to rest a finger) and evidently without the least inconvenience. Reaching the spineless base of the farther plant, he rested from his travels—content to remain near the friendly cactus, which furnishes both food and shelter to our Californian snails. *C.R.O.*

MICHEL EUGENE CHEVREUL.—The distinguished French chemist, Michel Eugene Chevreul, died in Paris, April 9. He was born before the outbreak of the French revolution, studied at Angers with the young Wellington and Napoleon, and went to Paris to push his fortunes a year before the latter became Emperor. Chevreul was born August 31, 1786, in Angers, and lived to see France twice an empire, twice a monarchy and thrice a republic. His father was a well-to-do physician in Angers, professor in the medical faculty and a talented writer. Chevreul was a very tall man, square in the shoulders and walked quite erect and straight.

In 1803, Chevreul entered Vauquelin's laboratory in Paris, where his aptitudes were quickly noticed, and in 1806 he was appointed the director of the laboratory, and professor in the Lycee Charlemagne. In 1810 he was appointed *aide-naturaliste* in the Museum of Natural History, then examiner for the *Ecole Polytechnique*; and at thirty he was professor of chemistry in the Gobelins, the world-known manufactory of tapestry, and director of the department of tinctorial baths. In 1826, after the death of Proust, Chevreul was appointed member of the Academy of Sciences. Not one of his colleagues at that time is now living. He never missed a meeting of the Academy, up to his hundredth birthday, and it is not long since he might have been seen walking to the Institute, hat in hand, and hands behind his back.

As a man, Chevreul had a pleasant expression, amiable, kind-hearted and good-natured, devoid of pedantic manners. His life was a very quiet one, devoted wholly to work and study.

He possessed ample means, enjoyed society, where he was a favorite.

The chemistry of fatty substances, and theory of complementary colors were the two most important lines of study followed and developed by him, Millions have been earned by the application of his methods for obtaining a number of useful substances, such as stearine and glycerine.

THE LATER DEW THEORY.—It is now held by the best physicists that, instead of falling from above, the dew rises from the earth. The generally-received opinion that the dew is formed of vapor existing at the time in the atmosphere must be given up for the established fact that the vapor which rises from the heated earth is trapped by the cold surface earth. Besides, when we imagine that, on a cool evening after a sultry day in summer, our feet are being wet by the dew on the grass, we make a grave mistake. For that moisture on the grass is not dew at all, it is not dew at all, it is false dew—in reality the transpired humor of the plants. The drops at the tips, which glisten diamond-like, are not dew; close examination shows that these crystalline spheres are all situated at the points where the veins of the leaves cut the outer edges. These drops only give evidence of the vitality of the plant. The difference between the true dew on the grass and the exuded drops through the veins from within the grass can be easily distinguished; for the former is distributed all over the blade in a moist film; whereas, the latter are of some size, and are situated near the tips of the blade. Altered then is the meaning of the line, ‘‘Ilka blade o’grass keps its kin drap o’ dew;’’ for those brilliant globules, shaking to the same sweet air, and often ‘‘gliding at once all fragrant into one,’’ are not dewdrops, but are the exudations of the healthy plants. They give evidence of the elixir vitæ of vegetation; whereas the true dew is the pearly luster, varnished in flimy humidity over the blades by that wondrous alchemy which transforms the water vapor rising from the ground into the plant-refreshing dew.—*Good Words.*

MINERALOGICAL NOTES.

PHENACITE FROM MAINE—In May, 1888, some crystals of phenacite were found near Stoneham, in a vein of coarse albitic granite, associated with crystals of smoky quartz, topaz and muscovite.

ARAGONITE PSEUDOMORPH—Among a collection of minerals from Pima county, Arizona, was a crystal originally aragonite, which had been almost entirely changed and impregnated by oxide of manganese and red oxide of iron. It has an outer coating of white cacholong over some simple rhombohedral crystals, now entirely changed to an oxide of manganese. The crystal is hollow on top to the depth of three-fourths of an inch. The sides of

the cavity are lined with cacholong, but the bottom of the cavity is partly filled in with a white compact chalcedony. The interior of the crystal is radiated, but is of a dark chocolate color and almost entirely altered to hematite.

ZIRCON—This mineral is now mined by the ton in the United States, and about \$150 per ton is paid for it, because of the earth it contains (Zirconia) which is used in the hoods for the new incandescent gas burners. The Zircons are obtained by washing out the soil resulting from the decomposition of felspathic rocks.

OBSIDIAN—Obsidian has been found in British Columbia, but it has little value, except for the cheaper jewelery, and is rarely used for that purpose.

PARIS EXPOSITION—Messrs. Tiffany & Co. exhibit a collection illustrating the occurrence of precious and ornamental stones in North America, containing all the more important varieties, in their natural state and in cut examples. The 352 labels include crystals of gold, gold and silver ornaments from Indian mounds, diamonds, rubies, sapphires, topaz, emerald, beryls, garnets, tourmalines, zircon crystals, peridot, quartz, amethyst, opal, agate, rutile, turquoise, amber and many other minerals not so well known to the public as gems.

TURQUOISE—Additional evidence of the antiquity of the turquoise workings of New Mexico and Arizona has been gathered by the Hemenway Expedition under the direction of Mr. Frank H. Cushing. About ten miles from Tempe, Arizona, a shell encrusted with turquoise and garnet, representing the form of a frog, was found in the excavations.

CHRYSOPHRASE—Beautiful semi-transparent chrysophrase of fine color occurs in Tulare county, California. This gem has also been found in Douglas county, Oregon. *George F. Kunz.*

BIBLIOGRAPHY.

J. JENNER WEIR—Exhibited a female example of *Danaus plexippus* from Custer county, Colorado, to South London Entom. Society. This specimen differed from the examples from more northern localities, in having all the spots on the black apical patch on the fore wings white, instead of fulvous. Mr. Wier also exhibited *Pieris oleracea*, and stated that he had heard from Mr. Scudder that this species could be readily distinguished from *P. napi* in the larval and pupal stages. *Entomologist*, February, 1889; page 52. *T. D. A. C.*

J. W. DOUGLAS—Notes on some British and exotic Coccide. *Ent. Mo. Mag.*, March, 1889, page 232. Notes on *Icerya purchasi*, partly quoted from Prof. Riley and Mr. R. T. Lewis (in litt.) with figure of the larva of *Icerya*. *Hippodamia ambigua*

preys upon *Icerya* in California, and in South Africa its increase is checked by *Rodolia iceryæ* and *Chrysopa iceryæ*.

T. D. A. C.

GEORGE D. HULST—'The Epipaschiinæ of North America,' 1889. Reprinted from *Entomologica Americana*, with a plate illustrating structural characters. Twenty species of this family of moths are described as occurring in North America, and very full details are given, both descriptive and synonymical, although the distribution is very slightly treated. There is also a catalogue of the species, in which, however, one species described in the body of the work (*E. Zelleri*) has been omitted. *Yuma* gen. nov., is founded on a species (*adulatalis*) from S. California and Texas, and *Attacapa*, gen. nov., on a Texan species. *A. callipeplella*. Several other species are recorded from the West.

T. D. A. C.

ULTIMATE FINANCE—A true theory of wealth. By William Nelson Black. The Humboldt Publishing Company, 24 East 4th street, New York. The first two chapters treat of the origin of property and the evolution of wealth, the third and fourth discuss the principles and possibilities of banking and insurance, and the fifth, sixth and seventh are devoted to a correction of the many misconceptions that abound on the nature of accumulation, and the administration of property. The book defines a system which, if found organically practicable, will enable men to carry insurance always without sacrifice of personal resources and sometimes with considerable gain.

H. F. WICKHAM—"A list of the Coleoptera of Iowa city and vicinity." *Bul. Lab. Nat. Hist., State Univ. of Iowa, Vol. I, No. 1*, pp. 81-92. A check list of the Coleoptera of this district, interesting for comparison with the fauna of the central region, from which it very markedly differs. The present recorder took two species, *Melanophila atropurpurea* and *Chrysochus cobaltinus*, which are not entered in Mr. Wickham's list, on a C. B. and Q. train near Chariton, Iowa, 1887. It is not certain, however, that they may not have boarded the train in some other State.

T. D. A. C.

THE JOURNAL OF MYCOLOGY—Vol. 5, No. 1, March, 1889. This is the first number of the new series of this journal, to be published quarterly by the Department of Agriculture, under the supervision of B. T. Galloway. It extends to fifty pages, with eight plates, and like all the other work of the department is thoroughly well done. A new genus, thirteen new species, and two new varieties are described, and there are also articles dealing with the economic side of the question, and reviews of new literature. The most interesting paper to western botanists is one by Mr. W. F. Anderson, on the fungi of Montana.

T. D. A. C.

THE NAUTILUS—No. 1, May, 1889. The first number contains an important contribution by W. H. Dall, on a species

of *Trochus* from the Atlantic; and of matters interesting to the west, a note on the occurrence of *Limosina* sp. in Texas, and a classification of the varieties of *Patula cooperi*. On page 9 the description of *Bulimulus hemphilli*, Wright, is referred to, and it is suggested that it might be compared with *B. marielinus*, Poey.

T. D. A. C.

WALTER E. BRYANT—New subspecies of song sparrow from Lower California (*Melospiza fasciata rivularis*-Brown's song sparrow). Proc. Cal. Acad. Sci., I, 197. This subspecies is dedicated to Mr. Herbert Brown, of Tucson, Arizona.

WALDEMAR LINDGREN—Geology of Baja California, l. c. I, 173. An interesting outline of the geology of the vicinity of Todos Santos bay, extending eastward to the border of the Colorado desert. As so little has been published on the subject, this fragmentary work is a valuable contribution, containing the results of a special trip made in 1888 by the author, who is connected with the U. S. Geological Survey. The cretaceous exposures at Punta Banda were the special attraction as tending to throw more light on similar exposures in the United States, but for which this foreign territory may not have been explored at this time.

C. R. O.

E. B. WEBSTER—The preservative (embalming) method of taxidermy, with chapters on making skins and skeletons. The author, Cresco, Iowa, 1889. A brief treatise, by the editor of the *Hawkeye Ornith. and Oölogist*, of special value for the young collector, being clear and concise.

C. R. O.

MELVILLE C. KEITH, M. D.—Diseases of children. Part II, Minneapolis, 1889. A valuable treatise for parents and nurses on the care of children, recipes and other medical information. The author is also editor of *Mother and Child*, a useful magazine for the family, and author of other medical books.

C. R. O.

EDITORIAL.

A friend asks which we "found the mightier, the pick or the pen?" The pick was decidedly the heavier! In the April issue (VI: 8, lines 22 and 23 from the top) read *millimeters* instead of inches, in the description of *Bulimulus Hemphilli*. We are indebted to Mr. F. Stevens for a number of scientific papers. We spent an evening in May at his home, looking over some of his fine bird and mammal skins, among others his new fox, the desert pouched rat, and other rare things. Dr. Edward Palmer returned successful from his excursion to the mouth of the Colorado river. Charles T Simpson, in the *Nautilus* for May, enters a protest against the indiscriminate genus making, now fashionable among certain conchologists. The same remarks would apply equally well to some of the work of West American

botanists. Our trips during the last few months have added thousands of insects, shells, plant specimens and a host of other objects to our private museum, which will furnish subjects for numerous contributions to science as soon as they can be placed in the hands of specialists for study. Our correspondents must pardon any seeming neglect on our part, as we are away much of the time. The condition of our post-office and its management furnishes us with a still further excuse frequently, and correspondents should write again if they fail of a reasonably prompt reply.

The mineralogical notes in this issue are selected from several papers received from George F. Kunz, to whom we are indebted for many favors and who keeps us posted on mineralogical news. The San Francisco Microscopical Society, again shows signs of activity. We have missed their interesting reports for some time.

NOTES AND NEWS.

There were only two sun spots during November and December, 1888, this being the year of sun spot minimum.

Rev. J. G. Wood, F. L. S., the well-known naturalist, and author of popular works on natural history, died early in the year.

Of the territory of Africa, England has the controlling influence over 1,000,000 square miles; Germany, 740,000; France, 700,000.

Mrs. M. K. Curran, M. D., recently visited San Diego, collecting numerous plants for the herbarium of the California Academy of Sciences.

W. G. Wright has returned from his trip into Mexico.

T. S. Brandegee has made an extended botanical exploration in Lower California, in company with Walter Bryant, the ornithologist, and others.

S. B. Parish is trying to raise certain classes of plants at his home from seed, to study the constancy of some of their characteristics.

Dr. C. C. Parry devoted some time this spring to the plants of Santa Barbara.

Papaver Californica has been observed abundant in San Diego county by the editor, and also by Mrs. Curran.

No trace of staminodia could be detected in fresh flowers of Hookera Orcutti, Greene, numerous specimens of which were lately carefully examined by the editor. The segments of the perianth are tipped with royal purple; the tube is white.

A large and life-like engraving of Prof. W. O. Atwater embellishes the *American Agriculturist* for March. Prof. Atwater is one of the most prominent agricultural scientists of the times. His articles on science applied to farming, in the *American Agri-*

culturist in previous years, and his extensive field experiments inaugurated (through the same magazine) in many parts of the country, were the most extensive co-operative enterprises of the kind ever undertaken. His articles on food in the *Century Magazine* have gained him a wide reputation. He is now director of the Storrs Agricultural School Experiment Station in Connecticut and chief of the Experiment Station Bureau in the Department of Agriculture at Washington. In the latter capacity especially he has a large field for usefulness, and enjoys the confidence of practical farmers as well as of scientific workers.

A specimen of *Haliotis Cracherodii* was recently seen in a San Diego shell store, with a brilliant red epidermis like that of *H. rufescens*. Another shell belonging to *H. corrugata* possessed an equally curious epidermis, of a purplish or violet color. The color in both of these shells was natural and a most beautiful freak of nature.

Boys will be strongly attracted by E. H. Barbour's biography of a two-headed turtle, in *St. Nicholas* for May, and regret the "Queer Pet's" early decease; and they will share with their sisters keen enjoyment of the mischievous "Cuff, the Orphan Bear-cub."

A new volume of *The Century* began with the May number, the frontispiece of which is one of Mrs. Foote's pictures of the Far West, "Cinching Up." The most timely papers are a series on "Samoa: The Isles of the Navigators." The first is by Dr. H. W. Whitaker, of the U. S. Navy, and is profusely illustrated. The second, also illustrated, is on "Our Relations to Samoa," by Mr. Geo. H. Bates. The third paper in this series is a brief one by Captain Erben of the U. S. Navy, who commanded the "Tuscarora" when it took Steinberger to Samoa in 1875.

From forty careful drawings of the planet Mars at the Lick Observatory in July and August, 1888, showing the details of the canals as seen through the great telescope, none has been seen *doubled*, as asserted and drawn by European observers of late years. The submerged continent had also reappeared in the great telescope in its former contour.

Dr. David Dietrich, author of the extensive *Forest-Flora*, and curator of the herbarium of the University of Jena, died October 23, 1888, in his ninetieth year.

C. G. Pringle's distribution for 1888 includes about 300 species of plants, mainly collected in the Mexican states of Chihuahua, Nuevo Leon, and Jalisco. Lists will be furnished on application. (His address is Charlotte, Vermont).

On April 6th, 1889, at Wichita, Kansas, the Wichita Academy of Science was organized. Its object is "to promote the study of science and stimulate original investigation." The corresponding secretary is Fred. L. Johnson, M. D.

Shells For Sale by C. R. Orcutt, San Diego, Calif.

- Aemaea, Esch.**
 15..depicta, Dall
 20..insecta, Hds
 05..mesoleuca, Mke
 15..paleacea
 05..pelta, Esch
 10..var. elevata, Orcutt
 05..testudinalis
- Acus, Humphrey.**
 50..aureola, Gray
 25..caerulescens, Lam
 25..crenulata, L
 20..denudata
 05..dislocata, Say
 20..maculata, L
 20..strigillata, Gray
 20..subulata, Lam
- Adeorbis, Wood.**
 25..subcarinatus, Mont
- Aula, H. & A. Adams**
 20..falcata, Gld
 15..stylina, Cpr
- Alexia, Leach.**
 10..personata, Midd
 05..setifer, Cooper
- Alvania.**
 20..aequisculpta, Cpr
- Amalthea, Schum.**
 50..conica, Schum
- Amiantis, Cpr.**
 00..callosa, Conr
- Annicola, Gld. & Hld.**
 05..cincinnatiensis, Anth
 10..cubeniana, D'Orb
 05..decisa, Hld
 05..grana, Say
 05..integra, Say
 05..lapidaria, Say
 05..limosa, Say
 15..longinqua, Gld
 05..lustrica, Say
 10..pallida, Hld
 20..panamensis, Tryon
 05..parva, Lea
 05..porata, Say
 25..sp. indet, Utah
- Ampibola, Schum.**
 20..fragilis, L
 12..nux-avelana, Chem
- Ampiphisa, H. & A. Ad.**
 10..corrugata, Rve
 10..versicolor, Dall
- Ampullaria, Lam.**
 50..chiqintensis, D'Orb
 00..cumingii, Sby
 00..olivacea, Spix
 50..scalaris, D'Orb
- Amycla, H. & A. Ad.**
 05..carinata, Hds
 10..var. hindsii, Rve
 15..chrysalloidea, Cpr
 10..gausapata, Gid
 20..nachis, H. & A. Ad.
 10..coronata, sby
 10..fluctuata, Sby
 10..guatamalensis, Sby
 10..penicillata, Cpr
 20..pygmaea, Sby
 20..rugosa, Sby
 20..rugulosa, Sbv
 20..subturrita, Cpr
 20..varia, Sby
- Ancillaria, Lam.**
 50..accuminata, Lam
 15..ampla, Gmel
 20..candida, Lam
 20..cinnamona, Lam
 15..fulva, Swains
 75..glabrata, Swains
 00..montronzieri, Sby
 15..rubiginosa, Swains
 40..tankervillei, Sby
 40..torosa, Mensch
 20..vesicula, Gmel
- Anapa, Gray.**
 50..triquetra, Hawley
- Anculosa, Say.**
 10..ampla, Anthony
 05..plicata, Conr
 10..rubiginosa, Lea
- Ancylus, Geoffroy.**
 05..fluvialis, L m
 20..lacustris
 15..rivularis
- Angitrema, Hald.**
 50..angulata, Wetherby
- Angulus, Schum.**
 10..gouldii
 10..mostestus
 10..obtusus, Cpr
 15..variegatus
- Anodonta, Cuvier.**
 2.00..bridgesii, Lea
 50..caiforniensis, Lea
 1.00..corpulenta, Cpr
 50..cygnaea, L
 1.00..var. inflata
 1.00..var. limpida
 50..edentula, Say
 75..ferrusaciana, Lea
 25..fluvialis, D'Orb
- Anomia, L.**
 20..aculeata, Gmel
 10..ephippium, L
 25..glabra, Verrill
 25..lampe, Gray
- Aporrhais, Dillw.**
 25..occidentalis, Beck
 25..pes-petecani, L
- Asaphis.**
 25..dehorata, L
- Arca, L.**
 20..americana
 15..incongrua
 30..mutabilis
 15..noae, L
 30..ponderosa, Say
 30..solida, B & S
 30..tetragona
 30..virescens, Rve
- Assiminia, Leach.**
 10..californica, Tryon
- Astarte, Sby.**
 15..castanea, Sby
 25..conradi, Shuttl
 25..equimulti, Baird
 15..sulcata, Da Costa
- Astyris, H. & A. Ad.**
 10..aurantiaca, Dall
 10..chrysalloidea, Cpr
 10..tuberosa, Cpr
 10..variegata, Stearns
- Atys, Montfort.**
 20..cylindrica
- Auricula, Lamarck.**
 50..parva, Swainson
 50..aurismidae, L
 25..elongata, Parr
 05..fasciata, Desh
 25..solida, Swainson
- Avicula, Lam.**
 25..brevicauda, Desh
 20..hirundo, L
 20..margaritifera, Brug
 25..tarentina
- Axinaea, Poli.**
 50..maculata, Brod
- Bankivia, Beck.**
 10..varians, Beck
- Barleicia, Clark.**
 10..haliotiphila, Cpr
- Bithynia, Gray**
 15..leachii, Shep
 05..tentaculata, L
- Bela, Gray.**
 20..brachystomoides
- Bittium**
 05..filosum, Gld
 10..lawleyanum, Crosse
 05..nigrum, Pottm
 15..quadrifilatum, Cpr
 05..reticulatum, DC
 05..scabrum, Olu
- Blauneria, Shuttl**
 1.00..pellucida, Pfr
- Bryophila, Cpr**
 15..setosa, Cpr
- Buccinum, L**
 25..glacialis
 20..undatum, Lam
 25..undulatum, Moll
- Bulinnea, Hald**
 25..megasoma
- Bulinus, Adams**
 10..hypnorum, L
- Bulla**
 20..Adamsi, Mke
 20..ampulla, L
 15..occidentalis, Adams
 20..solitaria, Say
- Busycon, Bolten**
 50..peversum, L
- Caecum, Flem**
 10..californicum, Dall
 25..crebricinctum, Cpr
- Calliostoma, Sun**
 50..annulatum, Mart
 20..canaliculatum, Mart
 15..costatum, Mart
 50..gemmulatum
 50..exiguus, Pult
 15..striatus, L
 50..tricolor
- Callista, Poli**
 25..gigantea, Chem
 25..maculata, L
 50..lupisearia, L
- Callopoma, Gray**
 50..fluctuosum, Gray
 50..fokkesii, Jones
 25..tessellatum, Reeve
- Calyptraea, Lam**
 25..conica, Brod
 10..chinensis, L
 50..dilleyani, Gast
 20..equestris
 20..striata
- Cancellaria, Lam**
 35..reticulata, L
 30..similaris, Sby
- Canthurus, Bolten**
 50..tincta, Conr
- Cardita, Brug**
 25..affinis, Sby
 25..floridana, Conr
 15..sulcata, Lam
- Cardium, L.**
 50..aculeatum, L
 2.00..blandum, Gld
 50..corbis, Mart
 10..consors, Brod
 20..islandicum
 50..isocardia, L
 75..magnum, Born
 25..muricatum
 15..mortoni, Conr
 40..norvegicum, Speng
 1.00..paucicostatum, Sby
 25..serratum, L
- Casmaria, H. & A. Ad.**
 50..vibex, L
- Cassidula, Ferrussac.**
 50..crassiuscula
- Cassis, Lamarck.**
 1.00..abbreviata, L
 75..eburneus, Brug
 50..undatum, Mart
 50..testiculus, L
 1.00..tessellata
- Ceratisolen, Forbes.**
 1.00..legumen, L
- Cerithidea, Swains.**
 20..ambigua, C B Ad
 10..californica, Nutt
 15..decollata, Lam
 10..icstoma, Pfr
 20..mazatlanica, Cpr
 25..montaguui, D'Orb
 25..obtusa, Lam
 15..ornata, Ads
 15..puchra, C B Ad
 10..scalariformis, Say
 15..tenuis, Pfr
 25..varicosa, Sby
 15..mamillata, Risso
- Cerithiopsis, F. & H.**
 15..tuberculata, Mart
 15..tubercularis, Mart
- Cerithium, Brug.**
 20..carbonarium
 20..echinatum, Lam
 05..ferrugineum, Say
 20..fasciatum, Wood
 10..fasciatum, Risso
 10..litteratum, Born
 25..maculosum, Kien
 20..mamillatum, Risso
 10..morus, Lam
 10..muscarum, Say
 10..nigrescens, Mke
 40..nodulosum, Brug
 35..obeliscus, Brug
 25..polygonum, Sby
 20..reticulatum, Da Costa
 05..rupestre, Brug
 15..scabrum
 10..stercus-muscarum
 15..var
 05..septemstriatum, Say
 10..uncinatum, Gmel
 20..versicolor, C B Ad
 20..violaceum
 25..vulgatum, Brug
- Chama, L.**
 50..acnella, L
 22..arcinella, L
 25..exogyra, Conr
 25..macrophylla, Chemn
 20..spinosa
 00..sp. indet, Gu' Cal
- Chemnitzia, D'Orb.**
 25..castanea, Cpr
 25..stylina, Cpr
 25..tonucula, Gld
 25..torquata
- Chilina, Gray**
 1.00..fluctuosa, Gray
 1.00..fluvialis, Gray
- Chione, Megerle**
 25..californiensis, Brod
 20..cancellata, L
 50..dombi, Lam
 50..granulata, Gmel
 40..grata, Sby
 20..paphia, L
- Chiton, L**
 50..acuta, Cpr
 15..apiculatus, Say
 20..c. nereus, L
 25..decoratus
 20..circulus
 20..gemme, Cpr
 25..lamuginosa, Cpr
 1.00..tunicata, Sby
 50..hindsii, Gray
 30..mertensii
- Chionina, Wood**
 1.00..wassnenskii, Midd
 1.00..stelleri, Midd
 50..stokesii
 15..lineata, Wood
 30..rugatus
 70..lignosa, Gld
 40..merckii, Midd
 1.00..acrior

Chiton, L.—Cont.

- .20...stratus
- .35...piceus, Gmel
- .50...cooperi
- .55...palmulatus, Cpr

Chlorostoma, Swains

- .10...ater, Lesson
- .10...argyrostomus, Gmel
- .15...aureotinctum, Fbs
- .15...brunneum, Phil
- .15...lineata, Da Costa
- .20...pfeifferi, Phil

Chrysodomus, Swain

- .15...dirus, Rve

1.00...kennicotti, Dall

Circe, Schumacher

- .25...divaricatus, Lam
- .50...gibba, Lam
- .35...rivularis, Born

Clypidella, Swainson

- 1.00...binaculata, Dall
- 1.00...callomarginata

Collonia, Gray

- .15...granulosa, Pse
- .25...vitensis, Bar

Columbella, Lam

- .10...carnata, Hds
- .10...cribraria, Lam
- .20...concinna, Sby
- .20...duclosiana, Sby
- .flava, Lam
- .05...fulgurans, Lam
- .10...fuscata, Sby
- .10...gausapata
- .10...haemastoma, Sby
- .15...lunata, Sby
- .20...lutea, Suoy
- .20...maculosa, Sby
- .20...major, Sty
- .05...mercatoria, L
- .10...nitiela, Lam
- .20...obesa
- .20...paytensis, Lesson
- .05...rustica, L
- .10...scripta, L
- .15...scumpicata, Stearns
- .20...strombiformis, Lam
- .20...semiconvexa, Lam
- .10...varians, Sby
- .20...versicolor, Sby
- .20...zebra, Gray

Cominella, Gray

- .50...costata, Suoy

Concholepas, Lam

- .25...peruviana, Lam

Conchelix, Swains

- .50...conicus, Schuin

Conus, L

- .25...abbreviatus, Conr
- .30...achatinus, Chemn
- .75...amadis, Mart
- 1.00...ammiralis, L
- .20...arachnoides, Gmel
- 1.25...araneosus, Hwass
- .30...arena
- .40...arenatus, Hwass
- .50...archiepiscopus, Hw
- .20...aristophanes, Ducl
- 1.25...augur, L
- .10...aurantius, Hwass
- .30...australis, Lam
- 1.25...bandanus, Hwass
- 1.25...betulimus, L
- .50...capitanus, Hwass
- .25...catus, Hwass
- .35...cedonulli, Brug
- .30...ceylonensis, Hwass
- .35...cinereus, Hwass
- 1.00...cingulum, Mart
- .20...concinnus, Brod
- 1.00...costatus, Chem
- .30...daucus, Hwass
- .30...distans, Hwass
- .40...eburresus, Hwass
- .75...figulinus, L
- .50...flavidus, Brug
- .25...floridensis, Gabb
- .10...franciscanus, Hwass
- .25...fuscatus, Born
- 1.00...gabrieli, Kr

- .50...generalis, L
- .60...geographus, L
- .40...gladiator, Brod
- .30...glans, Hwass
- .20...granulatus, Hwass
- .35...gubernator, Brug
- .25...hebraeus, L

- 1.00...hyena, Brug
- 1.25...imperialis, L
- .25...interruptus, Sby
- .30...lacteus, Lam
- .50...legnarius, Rve
- .50...leonus, Brug
- .60...lineatus, Chem
- 1.00...literatus, L
- .30...lithoglyphus, Mesch
- .50...livilus, Brug
- 1.50...maculatus, Sby
- .25...mahogani, Sby
- .50...marmoreus, L
- .25...mediterraneus, Brug
- 1.00...mencomtaraon, Ch
- .15...menotus, Brug
- .35...miles, L
- .25...miliaris, Hwass
- 1.00...millepunctatus, L
- .25...minimus, L
- .60...monile, Brug
- .20...mus, Hwass
- .25...musicus, Hwass
- .20...nebulosus, L
- .60...nussatella, Burg
- .25...nux, Brod
- .40...obesus, Brug
- .40...omaria, Brug
- .30...parius, Rve
- .50...papilionaceus, Brug
- 1.00...pealii, Green
- .25...planorbis, Born
- 1.00...princeps, L
- 1.00...prometheus, Hwass
- .25...proteus, Hwass
- .25...pulcarius, L
- .25...punctatus, Ch
- .25...puncticulatus, Hwass
- .50...purpurascens, Brod
- .20...pusilla, L
- .25...pusio, L
- .60...quercinus, Hwass
- .25...rattus, Brug
- .25...regularis, Sby
- .30...senator, L
- .30...spectrum, L
- .30...sponsalis, Chemn
- .50...spurius, Gmel
- .30...stercus-muscarum, Ch
- .40...stellatus, Rve
- .40...stramineus, Lam
- .75...striatus, L
- .50...sulcatus, Hwass
- .50...sumatrensis, Lam
- .25...taemiatus, Br
- .35...terebra, Br
- .30...terminus, Sby
- .40...tessellatus, Brug
- .25...testudineus, L
- .60...textile, L
- 1.00...tiaratus, Brod
- .30...tigris, L
- .15...tornatus, Br
- .50...tulipa, L
- .35...varius, Brug
- .20...venulatus, Hwass
- .30...vermiculatus, Brug
- .25...verrucosus, Brug
- 1.25...vexillum, Mart
- 1.00...victoriae, Rve
- .60...virgo, L
- .35...vitellus, L
- .25...vitulinus, Br
- 1.00...vulpinus, Brug
- Cooperella, Carp**
- .25...scintillaeformis, Cpr
- Coralliophila H & A Ad**
- .50...costulata, Bld
- Corbicula, Magerle**
- .50...pusilla, Bourg
- Corbula, Brug**
- .15...contracta, Say
- .10...gibba, Olioet

- .10...inoequivalois
- .20...lineolata, Say
- .15...nucleus, L

- Crassatella, Lam**
- .20...marginata, Cpr
- Crenelia, Brown**
- .10...glandula, Totten
- .20...marmorata, Fbs
- Crepidula, Lam**
- .05...aculeata, Gmel
- .10...convexa, Say
- .15...dorsata, var
- .30...dilata, Lam
- .15...elongata
- .15...excavata, Brod
- .10...fornicata, Gmel
- .10...marginalis, Brod
- .20...onyx, Sby
- .10...plana, Say
- .10...unguiformis, Lam
- Crucibulum, Schum**
- .35...corrugatum, Brod
- .20...trigonale, Ad & Rve
- .15...quinquinum, Les
- Cryptogramma, Meh**
- .20...impressa, Hanley
- .25...macrodon, "
- .25...squamosa, "
- Cuma, Humphrey**
- .25...coronatum, Lam
- .25...imperialis, Lam
- .25...kiosquiformis, Ducl
- .25...sacellum, Lam
- .25...tectum, Wood
- Cumingia, Clessin**
- .15...tellinoides, Coast
- Cyclas, Brug**
- .05...rivalis, Drap
- .05...rivicola, Leach
- .05...similis, Say
- .05...staminea, Con
- .05...transversa, Say
- Cymba, Brod**
- 1.00...neptuni, Gmel
- .25...porcina, Brod
- 1.00...proboscidalis, Lam
- Cypraea, Linn**
- .15...abella, Lam
- .20...achatina, Soland
- .25...acicularis
- .50...adusta
- .10...albuginosa, Maw
- .50...amathystea, L
- .25...annulus, L
- .20...annulata, Gray
- .40...approximans
- .50...arabica, L
- .25...arenosa, Gray
- .75...argus, L
- .40...arenaria
- .40...armadina
- .10...asellus, L
- .angustata, Gmel
- .50...aurantium, Mart
- .25...arabica, Lam
- .50...atomaria, Gmel
- 1.00...australis, Gray
- 1.00...barthelemyi, Gmel
- 1.00...bicallosa, Gray
- 1.00...bicolor, Gask
- .50...boivini, Kien
- .15...caput-serpentus, L
- .75...carneola, Mart
- .25...caurica, L
- .50...cervus, L
- .15...cinerea, Gmel
- .20...clandestina, L
- .40...cruentata, Gmel
- 1.00...cervinetta, Kien
- .25...cruenta, L
- .25...cicercula, L
- .35...cribraria, Lam
- .50...chrysostoma, Kien
- .15...citrina, Gray
- .50...clara, Gask
- .40...cofea, Gray
- .50...concava, Gray
- .25...childreni, Gross
- .25...contamina, Gray
- .30...controversa, Gray

- .20...candidula
- .25...costata
- .50...capensis, Gray
- .25...cervica, Sby
- .40...comptonii, Gray
- 1.00...cribellum, Gask
- .20...cylindrica, Born
- .75...cumingii
- .50...dubia, Gmel
- .35...eburnea, Br
- .25...ejentula, Sby
- 1.00...eglantina
- .15...erosa, L
- .25...errones, L
- .10...europea, Mont
- 1.00...exanthema, L
- .50...fasciata, Chem
- .50...felina, Gmel
- .50...flaveola, Lam.
- .50...fimbriata, Gmel
- .50...fragilis, L
- .50...fusca
- 1.00...gangrenosa, Dill
- 1.00...gemmula, Mof
- 1.00...goodallii, Gray
- .75...gracilis, Gask
- .75...guttata, Gray
- .40...globosa, Kien
- .15...helvola, L
- .35...histrio, Kien
- .25...hirundo, L
- .30...isabella, L
- .25...insecta
- .30...interrupta, Gray
- .20...irrorata, Gray
- .50...intermedia
- .50...irina
- .35...lamarckii, Gray
- 1.00...lurida, L
- .25...lynx, L
- .15...limacina, Lam
- .50...lentiginosa, Gray
- .50...lutea, Gmel
- .50...listerii, Gray
- 1.00...lathynis
- .50...madagascariensis, G
- 1.00...mauritanica, L
- 1.00...mappa, L
- .50...mus, L
- .20...moneta, L
- 1.00...maculata, Barnes
- 1.00...moniliaris, Lam
- .40...miliaris, Lam
- 1.00...menkiana, Desh
- 2.00...modesta
- 1.50...moosa, Brod
- 1.00...maueriae
- 1.00...macula, A. Ad
- 1.50...microdon, Gray
- 2.00...mappa, var rosea
- .25...neglecta, Sby
- .20...nucleus, L
- .30...nigropunctata
- .50...nymphii
- .25...nivea, Gray
- .20...nivosa, Sby
- .50...onyx, L
- .25...occelata, L
- .20...obvellata, L
- .20...obesa
- 1.00...oniscus
- .50...oryza
- .10...pulex
- 1.00...princeps
- 1.00...physis, Brocchi
- .40...pallida, Gray
- 1.00...pustulata, L
- .50...pantherina, Gray
- .30...picta, Gray
- .15...poraria, L
- 1.00...punctulata, Gray
- 1.00...pulchella, Sw
- .50...punctata, L
- .50...pyrum, Gmel
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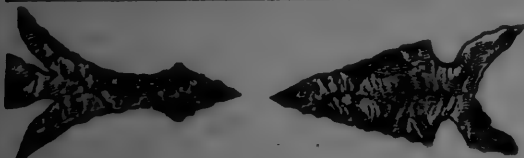
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THE
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*A popular monthly review and record for the Pacific Coast.
Official Organ of the San Diego Society of Natural History.*

C. R. ORCUTT, - - EDITOR.

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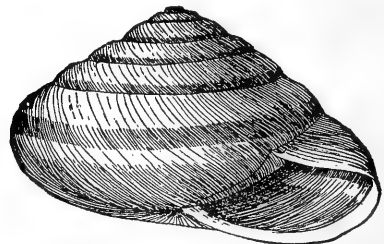
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THE WEST AMERICAN SCIENTIST.

VOL. VI.

JULY, 1889.

No. 45

CONTRIBUTION FROM THE SAN DIEGO BIOLOGICAL LABORATORY—II.

ON THE GENESIS OF THE COLOR-CELLS OF FISHES.

So far as I am aware the origin of the color-cells or chromatophores of fishes has never been discussed. A. Agassiz (on the Young Stages of Bony Fishes, ii) has described the color changes of young flounders, and Agassiz and Whitman have promised a discussion of the genesis of the chromatophores in the second part of their paper on "The Pelagic Stages of Osseous Fishes" which has not yet appeared.

My observations have been based on the embryos of many species, but for the present purpose only those of *Sciaena saturna*, *Hypsopsetta guttulata* and *Pleuronichthys coenosus* (?) are available. Naturally the genus *Stolephorus* and many other Isospondylous fishes in which no color is observed forty-eight hours after hatching, are not available for a study of the origin of the color-cells; nor can any use be made of such genera as *Oligocottus*, *Isesthes*, *Atherinops* and *Atherinopsis*, in which the color appears in the egg after several days, and then appears at sometimes widely separate portions of the embryo.

The eggs of *Hypsopsetta* and *Sciaena* may always be collected in greater or less abundance in San Diego Bay during the latter part of April, the whole of May, and at least a part of June. The eggs are deposited at about five o'clock in the evening. They are pelagic; the only difference between the eggs of the two species seems to lie in the slight difference in size and in the number of oil-globules, *Hypsopsetta* invariably having one, *Sciaena* from two to eight.

The eggs were carried a mile before they could be studied, so that, in the earliest stage observed the blastodisk was segmented into four cells. The embryonic ring and shield appear in about twelve hours; the blastopore closes in about eighteen hours; the embryos are freed from the membrane in less than thirty-six hours. At the closing of the blastopore, the embryo and a part of the yolk are covered with scattered chromatophores. At this time the individual chromatophore is a large cell with a distinct nucleus and a few color granules; there may be present one or

two pseudopods; the dendritic form is not developed for some time. The color granules of most of the cells are brownish-yellow; those of comparatively few cells being black. The cells are so large that they may readily be distinguished before any color is deposited in them. The term chromatoblast may properly be restricted to them at this colorless stage. There are no chromatoblasts distinguishable when the embryonic shield begins to form; they first appear when the gastrula covers one-third or one-half the yolk. *They are proliferated into the segmentation cavity from the embryo, where the latter joins the embryonic ring and from here they migrate to various portions of the embryo.* Just how they arise I cannot say, as means for sectioning are not at hand. Further observations of living eggs may clear this point. As the gastrula advances over the yolk they increase in number very rapidly, but, as far as I have observed, by the process of proliferation only.

They are somewhat angular in shape, the angles being sometimes prolonged into pseudopods. Their depth at this time is equal to that of the segmentation cavity. In their migration the pseudopods are usually foremost; amoeboid changes in shape were not observed, the whole cell moving forward. Most of the chromatoblasts are collected along the margin of the embryonic shield. When the embryonic shield narrows and the embryo becomes more definitely outlined the chromatophores rapidly migrate inward and cover the embryo, while others collect about the oil-globules and but few remain over the yolk. Shortly after the closing of the blastopore in *Sciaena* the oil-globules unite and the eggs of this species can then be distinguished from those of *Hypsopsetta* only by the very slight difference in size.

The chromatoblasts cannot be confounded with any other elements. They are approached in structure and position by the cells of the epiblast when about to divide. Such cells rise out from among the surrounding cells and project into the segmentation cavity, divide, and again sink to the ordinary level.

As chromatoblasts cannot be observed continuously from their origin to the chromatophore stage, should this process extend over several days or weeks, it is not possible to say positively whether the color-cells of the genera *Oligocottus*, *Isesthes*, etc., have a similar origin. The fact that their genesis in so widely different genera as *Hypsopsetta* and *Sciaena* is identical, would indicate that the color-cells in all fishes are developed in a similar manner.

Carl H. Eigenmann.

* Preliminary Notice.

CONTRIBUTIONS TO WEST AMERICAN BOTANY.

In this series of papers it is proposed to present in a connected form, such botanical observations as may be made by the writer, that may seem to contribute to a fuller knowledge of our West American flora. It is hoped that these may become worthy of the

above title as herbarium material and available literature increases. While much still remains to be done by the systematic botanist, it is believed that our flora offers a wider field for observations in other directions and of greater value to botanical science.

HOSACKIA (SYRMATIUM) HAYDONI.—Suffrutescent, six inches to a foot or more high, the slender stems woody at base, at first slightly spreading, then recurving inward and slightly intertwining, forming a loosely-compact bush, glabrous or nearly so throughout: leaflets three or less, oblong, obtuse, one to two mm. long: flowers single or more rarely in pairs, short pedunculate, two mm. long: calyx of equal length, the teeth narrowly subulate, erect, a half to one-fourth as long as the tube: pod but slightly incurved, usually twice the length of the persistent calyx, one seeded: seed dark olive-green, two and a half mm. long, slightly curved.

I take pleasure in dedicating this delicate species to Mr. Marion D. Haydon, in return for his hospitality and for his directing my attention to various forage plants whose valuable qualities had previously been unsuspected. Collected in April, 1889, growing among the rocks in a canyon leading into the Colorado desert, on the old stage line from San Diego to Ft. Yuma. With *H. glabra*, Torr., this plant is commonly known as the deer weed, but its smaller growth will render it less valuable for cultivation and it is apparently too limited in its distribution to assume importance as a wild forage plant.

STAMINODIA AND STAMENS.—In examining a large number of the flowers of *Hookera minor*, Britten, in the field this spring, I was somewhat surprised to find numerous specimens in which the staminodia were changed to perfect, fertile stamens. The first instance noticed was in a flower evidently injured by some insect, but so many examples were found later, where the staminodia were partially or wholly changed into anther-bearing stamens that I cannot ascribe it to the work of insects. This illustrates how little value can be placed in this genus on the unreliable characters of the stamens and staminodia.

HOOKERA ORCUTTII.—Greene, Bull., 6, Cal. Acad. Sci. 138. This species has been well characterized by Prof. Greene and is a very distinct species. Having examined a large number of the flowers in the field this season, I can speak positively of the absence of any traces of staminodia in any that I collected, and only three stamens were ever present. I first collected this species in 1882 in a valley about thirty miles north of San Diego, and later in the unusually wet seasons of 1884 and the present year. I found it abundant on our mesas, often associated with *H. minor*, Brit. The bulb is large, with a thick, fibrous envelope.

*TREES AND SHRUBS OF SAN DIEGO COUNTY,
CALIFORNIA.*

In the first bi-ennial report of the California State Board of Forestry, (1885-86), I contributed at the request of Hon. Abbot Kinney, a short paper under the above title. In it I briefly noted the general distribution in the county, of the ligneous plants that were known to me; thus it was necessarily incomplete, and some species were omitted as being scarcely worthy of mention. The article was further marred by a multitude of typographical errors and even whole paragraphs by other authors were wrongly inserted under my signature.

Botanical science would not have been seriously affected, however, had the history of this unfortunate paper ended with the report of the California Board. But Hon. B. E. Fernow, chief of the Forestry division of the U. S. Department of Agriculture, saw fit to criticise my gratuitous work as incomplete, in his second bulletin, (page 198), and, without consulting the writer or others who have had opportunity for an acquaintance with the subject, presented 'a complete list' of the trees and shrubs of San Diego county (pp. 202-5). This 'complete list' was compiled mainly from Watson's Botany of California, by Mr. Geo. B. Sudworth, and fully seventy species belonging to our flora was omitted, and nearly a score of species were erroneously admitted by him. Thus its scientific value was wholly destroyed, and curiously enough the compiler of this 'complete list' omitted nearly all the species enumerated in my paper, that were not mentioned in Watson's Botany.

The very evident worthlessness of this 'complete list' was enough to render criticism almost needless. But now a second edition of Bulletin No. 2, of the Forestry division comes to hand containing a list purporting to be a 'modification of that in the first edition.' In an editorial note the Chief says:

"The modifications have been made upon the authority of Mr. C. R. Orcutt and Dr. S. B. Parish, both of San Diego county, California. Thanks are especially due to Dr. Parish, who is writing a flora of this region, for the addition of several unpublished species. The cacti, and other plants not truly shrubs or trees, have been omitted. A few species, however, not always woody throughout, have been inserted. The fact that Mr. Kinney submitted a list confined to San Diego county must explain the insertion of such a limited list, while it would have been desirable to embrace the flora of Los Angeles and San Bernardino counties as forming a true botanical region."

This explanatory note of the Hon. B. E. Fernow is almost as unfortunate as the rest of the history of this article. A letter to the Chief criticising the 'complete list' (by which the first edition may most conveniently be designated) with his apologetic reply, forms the whole of the correspondence between us, and the mod-

ified list has nearly the same omissions as the 'complete list,' notably, the *Rhus ovata*, *Cixpressus Guadaloupensis*, *Berberis Fremontii*, and other well known trees and shrubs of our county, and even the palm was omitted from the 'complete list.' Mr. S. B. Parish, of San Bernardino, (*not* San Diego), who has an extensive acquaintance with the flora of Southern California, requested information relative to certain species that were included in the 'complete list' and after furnishing him with my notes, he informed me that a revision of the 'complete list' was in progress and that he would forward my notes for use in the revision. Evidently Mr. Parish has had as little to do with the 'modified' list as myself and should not be held in any way responsible for its errors. Only one species, *Euonymus occidentalis*, Nutt., is directly credited to me, and the unpublished name of Dr. Treleas, (*E. Parishii*) which is proposed for doubtless the same shrub, is given as a second species of this genus.

It is sincerely to be regretted that such inaccuracies should appear in even this comparatively unimportant paper in a publication of our government, as it tends to throw suspicion upon all the work of the Forestry division, and perhaps not with injustice in this case. So important an interest as our forests is worthy of the most careful and intelligent treatment, such as it receives at the hands of foreign countries.

It is not advisable at present to compile even an approximately complete list of our ligneous plants, pending the elaboration of recently collected herbarium material and copious field notes.

OUR FORESTS.

The true forests of San Diego county are, properly speaking, restricted to the higher mountainous region, comprising the Laguna, Cuyamaca, Smith's and San Jacinto mountains, usually at an altitude of 5,000 to 7,000 feet or greater. Considerable timber exists in these mountains, and at San Jacinto, saw-mills are continually at work, supplying the immediate vicinity with lumber, but none is exported. The timber is less valuable as a rule than that found at the north. Pine, and a little spruce and cedar, is the principle timber utilized. These forests are composed mainly of the following trees:

<i>Pinus Lambertina</i> , Dougl.	<i>Pseudotsuga Douglasii</i> , Carr.
<i>Pinus ponderosa</i> , Dougl.	<i>Libocedrus decurrens</i> , Torr.
<i>Pinus Coulteri</i> , Don.	<i>Abies concolor</i> , Lindl.
<i>Pinus Sabiniana</i> , Dougl.	<i>Quercus chrysolegis</i> , Liebur.
<i>Pinus Jeffreyi</i> , Murr.	<i>Quercus Kelloggii</i> , Newberry.

Pinus Sabiniana, Dougl., is not known to the writer but has been credited to the county. The only form of *Pseudotsuga Douglasii*, Carr., known by me to occur in the county, is the variety *macrocarpa*, Engelm., which does not approach in size the grand spruces of the north.

C. R. Orcutt.

EPOCH OF THE MASTODON IN NORTH AMERICA.

The most interesting of the animals that have recently, (in a geological sense), become extinct, is probably the American mastodon, (*Mastodon gigantes*) which, in connection with the mammoth, or fossil elephant, (*Elephas primigenius*) appears to have attained a great numerical development upon this continent at about the close of the Pleistocene, or the commencement of the Post-tertiary epoch. Geologists are enabled to determine with certainty the age at which these colossal herbivorous animals existed in this country, from the circumstance that their bones are found in a partially petrified or sub-fossil state, in superficial deposits, lying above the drift formation, as for example in peat-bogs or the mud and marl deposits of existing ponds and lakes, the origin of which, it seems, cannot extend far back of the introduction of man upon this continent. Some have thought that the mastodons and mammoths did not become entirely extinct in this country until after the advent of man, and find a support for their opinion in various traditions of the North American Indians, which represent their ancestors as warring against certain colossal animals, which are described as tree-eaters, and as never lying down, but leaning against a tree when they slept. Sir Charles Lyell, however, after a review of all the facts in the case, has arrived at the opinion that the period of the extinction of the mastodon, although geologically modern, must have been many thousand years ago. Judging from the distribution of their bones the mastodons appear to have existed most numerous in the valleys of the Ohio and Mississippi, and from thence to have roamed as far to the northeast as New York and New England. Their remains, however, have been but rarely found in New England, and it has been conjectured that the Hudson river may have acted as a barrier to their migrations. The mammoth, or fossil elephant, appears to have roamed over the same territories contemporaneously with the mastodon, but in much smaller numbers. In the western States the bones of these animals are found most commonly in the low places around the salt-lick spots, that are still frequented by deer and other wild animals that come to lick up the saline waters. At one such locality in Kentucky, known as the "Big Bone Lick" about twenty miles south west from Cincinnati it is estimated that the bones of one hundred mastodons and twenty mammoths have been dug up together with the bones of the megalonyx, buffalo, deer and other animals. The most complete skeletons of the mastodons have, however, been found in swamps and peat-bogs, in which the animals were probably accidentally mired and suffocated. The finest and largest skeleton in existence was discovered by some laborers engaged in digging marl from a swamp in Newburg, N. J., in the summer of 1845. It occupied a standing position, with the head raised and turned to one side and the

tusks thrown upwards the position natural to a quadruped when sinking in the mire. In the place where the stomach lay, and partially enclosed by the ribs were found about seven bushels of vegetable matter--i.e., bruised and chopped twigs and leaves--which, without doubt, represented the food last eaten by the animal. Some of these twigs, subjected to microscopical examination proved to be those of a coniferous tree, probably the white cedar. This skeleton was purchased by the late Dr. John C. Warren of Boston and is now preserved in that city. Its dimensions are as follows: Length, twenty-five feet; height twelve feet; length of tusks, ten feet. The total weight of the bones is two thousand pounds, and so slightly changed are they that they still retain a large proportion of their animal matter. In some instances there have been found in connection with the skeletons of the American mastodon, tufts of hair of a dun-brown color, varying in length from two to seven inches--thus indicating that the animal, like the Siberian mammoth, might have been fitted to endure a climate considerably colder than that in which the present elephant lives.

G. D. Story.

OPUNTIA FRUIT AS AN ARTICLE OF FOOD.

One of the most attractive fruits in the markets of Mexico and one that is always in demand is the fruit of the *Opuntia*, or *Tuna* as it is known to the Mexicans. Both the foreign and native inhabitants consume it, and with many, it forms the principal article of food for months in the year.

The seeds of some of the choicest varieties sold in the markets of Mexico were obtained and grown by the U. S. Department of Agriculture for distribution in localities suited to their cultivation. The *Tuna* of the Mexicans must not be confounded with *Opuntias* found in Arizona, New Mexico and Southern California the fruit of which is not utilized.

What is known as the cactus belt of Mexico furnishes many very fine species of *Opuntia* adapted to cultivation. When brought together, and each variety receives a name, as other cultivated fruits are distinguished, they will severally be sold and esteemed for their respective merits. Then especial growers of this cactus will appear and new varieties be produced by cross-fertilization and other means as in our northern fruits.

The potato and tomato when first introduced were little valued because their qualities were unknown; now the world would not care to do without them. The *Opuntia* fruit will be prized wherever known.

CULTIVATION.

Scarcely a plant known to man requires so little care in its cultivation as the cactus. It will grow in nearly any soil, but best in light sandy or gravelly combinations. The *Opuntia* reaches

the greatest perfection on the table-lands of Mexico, where owners of estates have assured me that they have realized beyond all expenses \$3,000.00 to \$5,000 00 annually from the sales of this fruit and its products.

The *Opuntia* takes root readily when a piece of plant is laid on the ground, or a little soil may be thrown on the top of a joint, so easily is it cultivated. It will stand considerable cold, and draught does not effect it beyond causing the plant to wilt at times, from which it quickly recovers. The dryness during the most protracted drought seems to increase the sweetness of the fruit.

Give the *Opuntia* one-tenth of the care in its cultivation that the peach requires and it will repay you with a delicious fruit that lasts for a much longer period for market; one better for shipment; one with good keeping qualities. No insects to molest it no dangers from frost, as it blossoms after the time of frost, and protected from thieves by its spines, you can enjoy its fruit unmolested. There are some who dislike all forms of cactus because of their spines, and consider them useless, but this is a mistake. All cacti are useful to animals and birds and may be utilized by man, and the spines simply prevent their rapid destruction by animals that would greedily devour these succulent growths were they not protected.

REMOVING THE SPINES.

When the fruit of the *Opuntia* is ripe, the fine spine upon their surface are readily removed by taking a bunch of grass, or any other suitable thing and switching the fruit, thus removing easily the downy spines, which, if not removed, would cause a little pain for a short time in handling the fruit. I have seen persons born among the *Tunas*, catch the fruit suddenly near the summit and wrench them off with their fingers apparently without suffering any evil consequences. If the spines are not removed at gathering, the fruit will have to be wiped before the rinds are removed, to prevent pain to the operator.

GATHERING THE FRUIT.

There are three methods resorted to in gathering *Opuntia* fruit; one with the hands; second, by wooden tongs; third, with a knife. The first method can only be resorted to when the plants are low, or in gathering from the lower branches of a tall plant. By taking hold of the fruit with the fingers and giving it a sudden twist it at once detached. This is no doubt the best method of gathering for market, as there is less bruising, and if the spines were previously removed, can be at once packed for market or the "jackets" removed for immediate use. The second method of gathering the fruit by means of wooden tongs is, so

far as the writer knows, only resorted to by Indians, who gather for their own consumption.

The knife in the hand of an experienced gatherer, can be made to detach a great quantity of fruit in a day. It is much used along the table-lands of Mexico on the great estates where the *Opuntia* grows to perfection; and the fruit by various means rendered profitable to the owners. The blade of the knife is made of steel and is inserted into the split end of a long strong stick, the length of which enables the gatherer of *Tunas* to reach with the knife blade the joint bearing ripe fruit. The plants are often eight to fifteen feet high. The fruit is arranged around the outer rim of the joints, so, when the gatherer brings the knife blade to the joint, he separates by a quick turn that part bearing the fruit, and as quickly thrusting the blade into the severed part, brings it to the ground, when the fruit is soon denuded of its fine spines and removed. Plants present an odd appearance after the terminal joints have been thus removed; but suffer no injury and the fragments readily take root and form new plants.

REMOVING THE SKINS FROM THE FRUIT.

It is surprising what a quantity of fruit can be deprived of skins and prepared for the palate by one pair of experienced hands. A thin slice is removed from each end of the fruit; a slit is then made through the peeling along the length of the fruit. The fingers press downward quickly the separated skin leaving the pulpy fruit exposed in a tempting manner. Thus prepared, the fruit is one of the sweetest, most nutritious and refreshing of fruits, mealy and juicy, most agreeable for the warmer seasons of the year in the United States. Especially is this fruit adapted for the breakfast-table; when the languid body needs something to aid digestion. If kept as cool as a watermelon, it will prove far more agreeable than that fruit, being of a similar flavor with that of the strawberry added, and it is healthier, more nutritious and longer in season than the watermelon.

This fruit is to be found in the Mexican markets in abundance and very cheap five months in the year, and is consumed by all classes and conditions of people. Venders are to be seen along all the roads. Along the Mexican Central Railroad the earliest Tuna is ripe in June and the latest varieties disappear in November, and you are offered them in small dishes, with the epidermis removed, a thorn from the mesquit tree to carry the tempting morsel to the mouth.

This fruit is finding its way all along the frontier of the United States, and this winter I saw some fine fruit on a stand in Jacksonville, Fla., for sale.

Americans and foreigners consume this fruit with equal avidity with the Mexican and praise the flavor. When as well known in this country as in Mexico it will be utilized to the fullest degree.

Edward Palmer.

SOME NOTES ON TERTIARY FOSSILS OF CALIFORNIA.

PACIFIC BEACH.

An exposure of a deposit of tertiary fossils occurs at Pacific Beach, San Diego, California, on the ocean bluff north of the pavillion, extending for about a mile along the ocean beach and from five to twenty feet above tide water. In May and June, 1888, I made a small collection at this point, of which the following is a partial list:—

<i>Olivella biplicata.</i>	<i>Lucina Nuttallii.</i>
“ <i>boetica.</i>	<i>Cerithidea sacrata.</i>
“ <i>sp. indet.</i>	<i>Amphissa versicolor.</i>
<i>Conus Californicus.</i>	<i>Amycla carinata.</i>
<i>Surcula Carpenteriana.</i>	<i>Dentalium hexagonum.</i>
<i>Monoceros engonatum.</i>	<i>Cardita subquadrata.</i>
“ <i>var. spiratum.</i>	<i>Littorina scutulata.</i>
<i>Ranella Californica.</i>	<i>Pteronotus festivus.</i>
<i>Opalia anomala, Stearns.</i>	<i>Crepidula adunca.</i>
“ <i>varicostata,</i> “	“ <i>unguiformis.</i>
<i>Siphonalia Kelletii.</i>	<i>Nassa cooperi.</i>
<i>Janira bella.</i>	“ <i>perpinguis.</i>
<i>Pecten hastatus?</i>	“ <i>fossata</i>
“ <i>æquisulcatus.</i>	<i>Omphalius aureotinctus.</i>
“ <i>3 sp. indet.</i>	<i>Chlorostoma Pfeiferi.</i>
<i>Tapes staminea.</i>	“ <i>gallina.</i>
<i>Scalaria sp. indet.</i>	<i>Haliotis splendens (fragment.)</i>
<i>Neverita Reclusiana.</i>	<i>Tellina bodegensis.</i>
<i>Norrisia norrisii.</i>	<i>Pomaulax undosus.</i>
<i>Pandora (mold only).</i>	<i>Macron lividus.</i>
<i>Fusus ambustus.?</i>	<i>Ocinebra poulsonii.</i>
<i>Acmæa mitra.</i>	<i>Calliostoma gemmulatum.</i>
“ <i>insessa.</i>	<i>Tivela crassatelloides.</i>
<i>Anomia lampe.</i>	<i>Drillia penicillata.</i>
<i>Ostrea lividus.</i>	<i>Myurella simplex.</i>

There were about a dozen other species, not identified as yet, among them a curious form resembling an oyster valve, very thick, but too imperfect for me to determine its character.

A whale barnacle, a fine shark's tooth, numerous bones of some large animal, caseings resembling those surrounding the shells of *Lithoglyphus*, calcareous tubes of *Serpulorbis squamigerus*, and numerous specimens of *Echinarachnius excentricus* were also obtained in this stratum. The locality is worthy of much more careful study than I have yet given it, but the above will prove sufficient to indicate its character. Three imperfectly defined strata can be here detected:—The older turned to sandstone, containing molds of various bivalves, and the imperfect valves above referred to as slightly resembling the oyster; the second containing the *Opalias*, *Janiras* and *Pectens* and a species of *Terebratula* (?); the third, more recent in character, containing the most of the other species.

FALSE BAY.

Along the shores of False Bay, which bounds the tract known as Pacific Beach on the south, are found numerous large deposits of shells, formed largely of *Donax Californicus* in places, and containing remains of echinoderms, besides other mollusks. These need to be studied in connection with those before mentioned, but I have as yet given them but small attention.

OCEAN BEACH.

Ocean Beach lies south of Pacific Beach, with False Bay between them. Both lie within the limits of San Diego city. About two miles south of Ocean Beach, near the top of the cliff, about forty feet above tide water, I found another exposure in June, 1888, where I made a collection of about fifty species of shells, including those species given in italics in the Pacific list, and the following additional shells.

<i>Omphalius fuscescens.</i>	<i>Hipponyx</i> sp. indet.
<i>Monoceros lugubre.</i>	<i>Chiton</i> (valves).
<i>Lottia gigantea.</i>	<i>Haliotis cracherodii.</i>
<i>Acmaea spectrum.</i>	<i>Drillia moesta?</i>
“ <i>pelta.</i>	<i>Monoceros</i> sp.?
“ <i>scabra</i>	<i>Leptothyra</i> sp. indet.
<i>Gadinia reticulata.</i>	<i>Volvarina varia.</i>
<i>Fissurella volcano.</i>	<i>Bittium</i> sp. indet.
<i>Calliostoma canaliculatum</i>	<i>Cumingia Californica.</i>
<i>Glyphis aspera.</i>	<i>Lucina Californica.</i>
<i>Crepidula lingulata.</i>	<i>Platyodon cancellatum.</i>
“ <i>dorsata?</i>	<i>Zirphoea crispata.</i>
<i>Petricola carditoides.</i>	<i>Septifer bifurcatus.</i>
<i>Chama exogyra.</i>	<i>Pachypoma gibberosum.</i>
<i>Balanus</i> 3 sp. indet.	<i>Strongylocentrotus</i> sp.?
<i>Vermetus</i> ? sp.	<i>Serpulorbis squamigerus.</i>

This is a very promising locality, and a much greater variety may be expected after a more careful and thorough examination of the whole exposure—only a small part having been examined by myself.

ROSEVILLE.

From a cliff at Roseville, nearly east of the Ocean Beach locality and on the shore of San Diego bay, were numerous valves of *Pecten æquisulcatus*, *Chione simillima* and *C. fluctifraga*, imbedded in the soil a few feet above tide water. Other similar deposits are not rare along the bay shores. *C. R. Orcutt.*

THE REPUBLIC OF SALVADOR.

A little over thirty miles south of San Jose de Guatemala begins the republic of Salvador, the smallest, though the second in point of population of the countries of Central America. The little republic is indeed the most densely populated country in both Americas, with exception, perhaps, of some of the lesser

Antilles, for the Salvadorian Republic contains only an area of a little over 7,000 English square miles, while the number of inhabitants is nearly 800,000.

Salvador was always regarded as a very rich country, and before the conquest was called by the natives, "Cuscatlan," or the land of abundance. The country was already at that period very densely populated, and its inhabitants were warlike and fierce. They defended their independence in such a spirit that it required all the energy of such a man as Pedro Alvarado to conqueror and to bring them under the Spanish dominion.

Nowadays, though Salvador suffered and suffers still from constant wars and insurrection, the country is fairly prosperous, well governed, and the best educated republic of Central America. Agriculture is extensively and successfully practiced, and the export of the products of the country is augmenting every year.

As I leave the shores of Guatemala and approach those of Salvador I remark the difference between these countries. The coast of Guatemala is low and sandy with the mighty chain of the Andes far in the interior; that of Salvador is high and rocky and of volcanic origin. There is no sandy beach here, but the hills descend to the waters' edge and form a steep fantastic shore, not barren and wild, but green and covered with a crown of the most exquisite trees and parasitic plants.

The first harbor I meet on the coast of Salvador is Acajutla. It is a considerable town as the export place of the northwestern part of the republic. It is connected by railway with the city of Sonsonatte, further in the interior, one of the most important places in the republic.

Acajutla looks half like a city and half like an Indian village. The houses as usual are low, but the streets are paved. But what a pavement! I believe that even the streets of San Francisco have a better pavement than those of Acajutla. It is a torment for the poor barefooted Indians to walk on those streets, and even those who use shoes or boots are very anxious to avoid them.

The houses of Acajutla, and especially outside of the town proper, form a very curious sight. They are constructed of bamboo or rather coyoles branches and are protected by enormous and very high fences. But those fences are neither of wood, nor of stone nor wire, but of cactus. The cactus and especially the giant cardon grows here to an enormous size and very rapidly. Planted around the house in a short time it will grow to a considerable height and will form a most magnificent and durable fence. No animal and no snake can force such a formidable fence and the inmates of the house can rest secure. Sometimes the giant cardon reaches the stupendous height of sixty

feet, and when this is the case, you cannot see the house, but only a green and high palisade of tall and prickly cacti.

From Acajutla to La Libertad the shore of Salvador is known under the name of Costa del Balsamo, or Balsam Coast. It is a magnificent part of the republic, green and fresh, fragrant from the odor of numerous gorgeous flowers, watered by many mountainous creeks, covered with numerous haciendas and fincas. The hills, not too high or too steep, run in soft undulations to the shore, while toward the east they become higher and higher until they meet the principal chain of the Andes. The Balsam Coast itself produces indigo, sugar, cotton, tobacco, coffee and maize, and is of extreme fertility. But the glory of the coast is the famous balsam, known as "Balsam of Peru," which is produced in the woods of this coast in such quantities that over 30,000 pounds are annually exported.

Speaking about balsam, I must mention that under this term we understand now the balsams of Peru and of Tolu. Both balsams have a very fragrant odor and they are used in confectionary, in perfumery and especially in medicine. The two balsams mentioned are very similar to each other in their properties and both are produced by trees of the genus *Myroxylon*, or *Myrospermum* of the Leguminosae, *Myrospermum peruiferum*, commonly called the "Quinquino," grows in abundance in Central America, and chiefly from this beautiful tree is prepared the celebrated balsam of the coast of Salvador. *Myrospermum toluiferum* is a very similar species to the former, but grows mostly on the banks of the Magdalena river and in the mountains of Venezuela and New Granada. The mountains of Tolu gave the name to this balsam.

At the end of Costa del Balsamo we meet the fair town of La Libertad, the second harbor on the coast of Salvador. The scenery around the town is magnificent; in fact the prettiest on the coast, for just behind the harbor begin the hills, covered with the most costly woods and with magnificent fruit-bearing trees of the tropics. The cool stream, the river Chillama, runs close to the town; and on its banks the luxuriant vegetation reigns in its supernatural beauty. Over the houses of the town tower the high cocoanut trees laden with fruit, and close to them lingers the graceful curica, papaya, ceiba, henisaro, matalpalo, guayago del monte, guiscoyol, mahogany and nispero form dense groups; feathery, delicate leaves of banana and plaintains shine with the color of purest emerald under the glowing sun, and the taller columnar cardon cactus shoots like an arrow towards the blue sky.

The town of La Libertad is a small, delightful place, composed of low adobe houses, surrounded by luxuriant gardens. It is the harbor of San Salvador, the capital of the republic, and all merchandise destined to that place has to go through La Liber-

tad. The coach runs from the harbor to the capital, which is situated further in the mountains, on a high volcanic plateau.

San Salvador is now a fine and well built city, though it has none of its former splendor. In 1854 it was a magnificent city, with many churches, palaces and splendid buildings, but on the night of April 16th, of that year, it was completely destroyed by one of those terrific earthquakes which are so frequent in Central America. The city was rebuilt and was again partly destroyed in 1873. It remains, however, always the seat of government and the capital of the republic.

The inhabitants of San Salvador pride themselves on being the most polished and the most cultured in Central America. They read a great deal and study much, and are, without question, better posted on all social and political questions than are their neighbors of Honduras or Guatemala. The ladies study also a little, and willingly discuss all known, or unknown questions with anybody who happens to come in their way. With strangers they are free, bold and very anxious to know what the ladies in other countries do, how they dress and how they spend their time. The Salvadorian ladies flirt a little more than their sisters in other Spanish-American republics, and are very anxious to marry early. In fact, it is regarded as a disgrace if the lady does not marry. The Salvadorian ladies compare favorably with their sisters in Guatemala or Nicaragua. They are affectionate; generous, but quick tempered; brilliant, but superficial; vain and vacillating; courageous in the highest degree, but capricious. They like the song and dance, but not so much as the ladies of Leon.

South of La Libertad the coast is very rocky and steep, and contains no harbors until we reach the beautiful gulf of Fonseca. In that magnificent expanse of water Salvador possesses the old Spanish town and harbor of La Union.

La Union has a suffocating climate, for the harbor is landlocked and the fresh sea breeze seldom enters. It is burning hot everywhere and you breathe the air of a furnace. Had Charles Dickens been in La Union he would never have described Marseilles as he did in "Little Dorrit," for Marseilles compared with La Union would have been an arctic place. Here in La Union everything is hot; the wind, if there is any, the staring dusty streets, the sandy beach, and even the water within the harbor. The people do not walk on the streets in the daytime if they can avoid it, but remain at home smoking and swinging in large comfortable hammocks, for the hammock in this *tierra caliente* takes the place of a bed and very often of a chair.

La Union is a considerable but a very lazy and lifeless place. Only when the fair takes place—and this happens a few times every year—the inhabitants lose their lethargy and are as gay and

frivolous as the inhabitants of Leon and Puntarenas. They sing and dance and make love like veritable children of the sun.

The Andes of Salvador form a highly volcanic central range with no less than sixteen volcanic peaks from four to eight thousand feet high. The volcano Isalco near Acjutla is always in eruption, and the traveler can constantly see the fire and smoke, and hear the roar of ejected lava. Salvador possesses also many lakes and rivers, as for instance the lakes Guija and Llopango and the river Lempel and San Miguel. There are many considerable cities and towns in the interior, and among others are Sosonatte, Santa Ana and San Miguel. The richness of the country consists mainly of the products I mentioned before, and especially of tobacco, the best in Central America. The mineral wealth is not great, although there are some silver and iron mines near Santa Ana and Tabanco.

The government of the republic is carried on by a president, vice-president and two ministers. The legislature consists of two chambers, an upper one of twelve senators and a lower of twenty-four representatives. The standing army is only 1,000 men, though in case of necessity everybody is called to arms. In the last struggle with Guatemala (1885) Salvador in the short space of a few days had an army of 12,000 men, and what an army it was the battle of Chalchnapa has shown.—*M. Lopatecki.*

NATIVE PLANTS OF AUSTRALIA.

Australian plants have proved in many cases equally well adapted to the soil and climate of the Pacific Coast. The director of the Technological Museum, Sydney, furnishes an interesting book on the useful plants of that continent, from which we glean the following notes of some, as yet unknown to this coast.

It may not be generally known that Australia produces an indigenous hop, which in the early days of settlement, was extensively used for making yeast and beer.

Eucalyptus dumosa yields a kind of manna, which is eaten by the natives in some parts of Victoria. It is the nidus of an insect and is a starch-like substance resembling small shells, white or yellowish-white in color and sweet to the taste.

The settlers of Tasmania obtain a kind of cider from a species of gum, and another species (*Eucalyptus Viminalis*) also yields a sweet manna.

The native cherry (*Exocarpus Capressiformis*), has excited considerable attention in Europe from the fact that, contrary to the usual order of things, the stones grow outside of the fruit.

Baron von Muller recommends the culture of *Geitonoplesium cymosum* as a substitute for asparagus.

The native peach or *quandong*, *Fasauns acuminiatus*, makes

an excellent preserve or jelly and may be dried and used like preserved apples.

In waterless localities the fleshy roots of the needle or pin-bush *Hakea leucoptera*, yield good drinking water to those who understand how to get it.

The Rumquat or desert melon, *Atlantia glanca*, may be made into a fair preserve.

An infusion from the fragrant bark of the sassafras, (*Atherosperma moschata*) is used in the form of a beer and has a pleasant taste when taken with plenty of milk.

The natives of New South Wales and Queensland prepare a cake which resembles a coarse ship biscuit from a bean tree known as *Italic* or *Bogum*.

In cases of severe thirst much relief may be obtained by chewing the leaves of the shingle oak (*Casnarina stricta*.) Being of an acid nature the chewing of the leaves produces a flow of saliva.

The native currant (*Coprosura Billardieri*), the *Moor* of the natives of Coranderrk station was formerly used by the settlers in making puddings.

BRIEFER ARTICLES.

PRESERVING THE COLORS OF FLOWERS.—A process of preserving the colors of flowers in dried specimens, as used in Berlin, consists of steeping the plants in a solution of sulphurous acid containing one-fourth of its volume of methylated spirit. Delicate flowers require an immersion of but five or ten minutes, and thick leaves as much as twenty-four hours. They are then removed, the fluid is allowed to evaporate, and the plants are dried between paper in the usual way.

Sci. American.

A PETRIFIED BIRD'S NEST.—Harlan H. Ballard, President of the Agassiz Association, describes in *St. Nicholas* for June, his experience with a petrified bird's nest containing three eggs. It is a useful article and a timely warning against being "taken in" by any apparently wonderful production of nature. These nests it seems, are prepared in Italy by immersing in water impregnated with mineral salts, thus producing an artificial petrification. It may be well to note the distinction between the words, petrification, and fossil, which are too often used as synonyms: a petrification may be defined as anything "turned to stone," or encrusted by a mineral substance, and may be either natural or artificial; a fossil is "a substance dug from the earth," or plant or animal remains (petrified or otherwise), from the strata composing the surface of the earth. It would not be strange if the nest described by Prof. Ballard had been a natural petrification as he supposes it may be but for the presence of *three* eggs. It would be possible for a bird in our western country to build and hatch its young in such a situation as he describes, where the nest at a different season might be subject to the overflow of a non-peren-

nial spring, and one egg failing to hatch, might have remained in the nest. I have seen such a locality where the still green and growing moss was slowly but surely becoming petrified (*i. e.*, incrustated by a mineral, deposited on its surface, by the water flowing over it), while other mosses had become wholly petrified. The vegetable substance in some specimens had decayed, while in others, only the fibres, incrustated by a calcareous substance, still remained. Specimens of petrified moss are not rare from the State of Michigan, but the locality I refer to was in the mountains of Lower California, and I am confident that the "water is dry" a great portion of the year and would not interfere with nest building, should a bird select the site and begin operations before the rainy season. *C. R. Orcutt.*

ALBINISM AMONG FLOWERS.—The editor has collected specimens of each of the following plants bearing only pure white flowers. Usually the whole plant was of a lighter green than that of the other plants which bore flowers of the normal hue.

Delphinium decorum, F. & M.	Brodiaea capitata, Bth.
Linaria Canadensis, Dum.	Sidalcea humilis, Gray.
Mirabilis Californica, Gray.	Gilia dianthoides, Endl.
Orthocarpus purpurascens, Benth.	Erythraea venusta, Gray.

A single plant of *Mimulus cardinalis*, Dougl., was once found in Lower California, with yellow flowers, which a well known botanist proposed to call a new species, but I advised him of its true character in season.

The *Erythraea venusta*, Gray, is often pure white and runs through the lighter shades of purple into its normal color. In the wet spring of 1884 I secured so many large and beautiful white-flowered specimens of this, as to lead Dr. Gray to inquire if it was not a valid species. The plant is very variable otherwise as to size and shape of foliage and flowers. *C. R. Orcutt.*

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

SAN FRANCISCO MICROSCOPICAL SOCIETY,—June 12th, 1889.

A. H. Beckenfeld, the Vice President, was present for the first time since recovering from his severe illness, and was cordially welcomed. His contribution to the evening's programme represented some fine specimens of *Melacerta ringens*, a tube-building rotifer, belonging to the family of wheel animalcules. This variety is considered the most beautiful of the species, and builds for its protection an ingenious tube, which it forms of round pellets that are elaborated in the interior of the animalcule, and securely gummed together with a secretion derived from the same source. This rotifer, when feeding, extends itself partly from its tube and by means of several rows of cilia produces a rapid rotary motion one set of cilia drawing a current of water containing food to its mouth, while another row ejects the debris by a current produced

in an opposite direction. The tube and occupant are highly transparent and viewed by dark ground illumination never fails to excite astonishment and wonder at the sagacity displayed by nature in protecting these minute organisms from their enemies and furnishing them with such elaborate means for obtaining their subsistence. Mr. Breckenfeld also exhibited a slide of *Æcidium* or "cluster-cup fungus" found infesting the scanty vegetation on Signal Peak, Yosemite Valley, some seven thousand feet above sea level.

Dr. E. G. Clark exhibited some interesting slides of Cinnabar ore in Chalcedony, showing free mercury, a rare thing in the natural state. The gentleman also showed a beautiful mounting of chrystallized gold, displaying the peculiar fern-leaf disposition of the chrystals produced by the galvanic current.

The most notable feature of the evening was the exhibition by Charles C. Riedy of his collection of old and rare works of the early writers on microscopy. To the student and all interested in micrographical literature this was an opportunity seldom offered to examine many volumes published by the pioneers in this branch of science, that are now very scarce. Mr. Riedy is devoted to the study of the Infusoria, and to facilitate his inquiries in that direction the present collection has been slowly accumulated, though not without great difficulty and perseverance, many of his orders for special works having been several years in the hands of European book-dealers before they were obtained. The different volumes cover the entire field of microscopical research from its very beginning, and contain a complete resume of the evolution of optical science, together with the progress of mechanics as applied to the microscope. Many of the editions, in fact a majority of them, contain a high grade of illustrations considering the date when they were executed, while some are embellished with fine-lined copper-plate engraving that would do credit to our own day. The oldest publications, belonging to the fifteenth and sixteenth centuries, are all bound in heavy parchment, and mostly written in the scholarly language of the time—Latin. The printing is remarkably good and legible, there being no perceptible fading of ink or paper. The authors represented were Adams, Baker, Baster, Bonanni, Descartes, Ellis, Eichhorn, Gleichen, Gotze, Grew, Hill, Hooke, Joblot, Ledermuller, Leeuwenhoek, Martin, Needham, Power, Redi, Schaffer, Glauber, Smith, Spallanzani, Schott, Swammerdam, Trembley. Notable among these are Descartes' works, with numerous wood-cuts, small quarto, Amsterdam, 1650. This work contains an illustration of Descartes' gigantic microscope eight feet high.

In the collection is Powers' "Experimental Philosophy, in three books, containing new experiments, microscopical, mercurial, magnetical." London, 1664. This last work is the earliest volume on the microscope in the English language.

Before adjourning a unanimous vote of thanks was tendered

Mr. Riedy for his interesting exhibition of what is certainly the most unique collection of rare microscopical literature in the United States.

C. P. Bates, Rec. Sec.

SANTA BARBARA SOCIETY OF NATURAL HISTORY.—May 25, 1889. Dr. L. G. Yates presented a specimen of Allanite from Santa Barbara county, and read a paper on this new and rare mineral. Mr. Goodyear, of the State Mining Bureau, in a letter to Dr. Yates, stated that the portion of Santa Cruz Island already examined to be mostly volcanic rock.

BIBLIOGRAPHY.

L.H. BAILEY. Studies of the types of various species of the genus *Carex*. Mem. Torr. Bot. Club, Vol. 1, No. 1., New York, 1889, 8vo pp. 85. Price, \$1.00. The author presents the results of an examination of the existing types of the North American species, which are widely scattered, largely in European herbaria. Numerous changes in nomenclature are naturally found necessary.

R. W. SHUFELDT. Observations upon the osteology of the North American Anseres. Proc. U. S. Natl. Mus. XI:215-251. Washington, 1889. From the author.

E. L. Greene. Pittonia Vol., 1, Part 6. March-May, 1889. The present number completes the first volume and contains an account of the vegetation of San Benito islands, off the Lower Californian coast, a treatment of some Californian Umbelliferae, descriptions of new species, and various botanical notes and discussions. Miss Mary Graham also contributes to this number her interesting "Reminiscences of Major John E. Le Conte."

NEW MEXICAN SPANISH ANTIQUITIES. *The Nation*. March 8.

COLONIZATION OF LOWER CALIFORNIA. *Science*. Apr. 5.

THE SAN FELIPE SINK, (California.) *Am. Meteorological Journal*. March.

D. MARIAGER. A Zuni Genesis. *Overland Monthly*. April.

W. CROSS. Denver Tertiary Formation. *Am. Jour. Sci.*, April.

F. A. FERNOW. Science and "Christian Science." *Pop. Sci. Mo.*, April.

T. F. T. DYER. Plants in Witchcraft. *Pop. Sci. M.*, April.

SENATOR STEWART. Reclaiming the Deserts of the West. *Forum*. April.

EMIN PASHA IN CENTRAL AFRICA. A collection of the White Pasha's letters and journals is issued by Dodd, Mead & Co., containing invaluable information gathered by him on his explorations. "On the geography of plants and animals"; and "On the state of civilization and politics" are the titles of two of the several headings under which the work is arranged. Two portraits of Emin Pasha, and a map are given.

EDITORIAL.

Each year presents a startling record of terrible loss of life and property by the elements. But 1889 surpasses any previous year in the history of the English race. Early in the year came the news of disaster at Apia, where our American navy suffered so severely. The sympathy of the whole civilized world is now aroused by the fearful calamity at Johnstown, Pennsylvania, on May 31st. Ten thousand people hurled into eternity by the pitiless torrent escaping from the Conemaugh artificial lake, upon its dam giving way, and two thousand more roasted alive in the conflagration that succeeded the flood. Before this loss of life, the twenty-five millions of property destroyed is insignificant. The whole Conemaugh valley is a scene of desolation, not only Johnstown, but other towns and villages and farm houses along this beautiful river have been washed away with thousands of their inhabitants. It is impossible at this time to estimate the total loss of life and property sustained by this section of country.

Our contributors will please note that MSS. should reach us as early as the first of the month preceding publication to secure the earliest insertion. Reports of societies and scientific news may be sent later but should reach us as early as possible, that they may not lose interest by delay. When possible, articles, especially if of a technical character should be prepared by a typewriter. Proofs are not read by the Editor but we have engaged careful and experienced readers for this service.

Europe, Asia and Africa has each contributed to the Editor's mail of late. As four months were consumed in transit by a letter from Asia, we shall not be burdened by correspondence from that quarter, but now that San Diego is likely to be soon in direct communication with China and Japan, through the Peninsula and Oriental Steamship line, we may hope that the *SCIENTIST* may become still better known in those countries.

Two or more new steamship lines are being inaugurated between San Diego and Mexican ports, which we hope may soon be in operation. The west coast to the south of us has been but little known to naturalists, and with these increased facilities for transportation, we may hope to learn more of its natural history in the near future. Numerous naturalists have already done what they could under existing difficulties, and each has found much of interest in every branch of science.

NOTES AND NEWS.

TATA-ALBUMEN is a variety of albumen, studied by Dr. Helbig which is transparent, even when boiled. It was first found in the egg of a certain species of sand marten. Later it was ascertained that by the action of soda or potash, ordinary egg albumen could

be converted into tata-albumen, it thereby becoming doubled in bulk and glassy in appearance. It is eight or ten times more digestible, more stable, and allows the addition of any spice.

"The Land of the Midnight Sun" must indeed be an interesting portion of the earth's surface to visit if we may judge from the extremely interesting and beautifully illustrated article about that region that appears in *Demorest's Monthly Magazine for July*.

The sound of the axe and the hammer, not only on the assembly grounds, but all around the lake is responded to by the people near and far in notes of preparation for the season's great annual festival at Chautauqua. Fifteen years have passed since the opening of this summer school in the woods. Chautauqua has ever refused to do any but thorough work, its power has become international, and it has bound friends by the thousand to itself. All the year round, through its literary circles and otherwise, its influence is felt not only in every state in the union but beyond the sea and the great gatherings of the summer are but the logical results of this vital under current.

The botanist of our U. S. Department of Agriculture is referred to by an English contemporary as *Sir* George Vasey. His descriptions of grasses adapted to arid districts are widely copied.

Lentils and tares are receiving considerable attention in South Australia, where they are cultivated for fodder.

Rabbits, sparrows, kangaroos, paddymelens, hares, foxes and kangaroo rats seem to be the more troublesome of the animals in Australia, on which the Government offers bounties.

A thick shower of small frogs is reported in the "Western district" by the *Victorian Farmers' Gazette*, of April 29th.

The rabbit diseases commission of New South Wales has reported unfavorably on M. Pasteur's proposal to extirpate rabbits by means of chicken cholera. The commission finds that the use of the microbes in the food does not cause the disease to spread rapidly from infected to healthy rabbits.

The latest maritime curiosity in British waters is a torpedo boat burning petroleum or tar refuse in place of coal. The vessel has made nineteen knots an hour without permitting any perceptible smoke, and is said to move quite noiselessly. She is 137 ft. in length and her crew numbers only seven men.

The wax-scale of Florida, (*Ceroplastes floridensis*) has been discovered in California, on trees imported this season from Florida, according to a note in *Insect Life*. It is not noted as a pest in Florida, but occasionally it will increase upon an individual tree so as to arouse apprehension.

Samuel Lowell Elliot died February 12, aged forty-five years. He was a careful student of the habits of insects and very suc-

cessful in contriving methods for rearing and studying living insects.

Mr. T. S. Brandegee and Mrs. Mary K. Curran, both of San Francisco, surprised their friends by a quiet wedding on May 29th. They were married in San Diego by Rev. Dr. Noble. THE SCIENTIST offers them its heartiest congratulations.

Messrs. T. S. Brandegee and Walter Bryant returned in May from an extensive trip through Lower California. We failed to meet Mr. Bryant and so did not learn the extent of his success, but Mr. Brandegee reported the collection of about thirty species of cacti; and altogether nearly a thousand species of plants, while his field notes will give the most southerly stations for many of the Californian plants.

Prof. L. F. Ward, (Proc. U. S. Natl. Mus.), shows that the genus *Platanus*, of only seven existing species, was at its zenith in the Cretaceous and Tertiary periods.

Chlorogalum parvifolium is abundant on portions of the San Diego mesas, where it grows scarcely six inches high. We recently measured a specimen of this lily which we collected in a canyon among our foot hills—the loose, spreading panicle of flowers, of which, stood *seven feet high!* The bulbs are frequently as large as onions, and the height above recorded is not exceptional.

Frederick A. P. Barnard, President of Columbia College, died April 27th. He was born May 5th, 1809, at Sheffield, Mass. He ranked with the most advanced thinkers of the day, and did much to enhance the scientific standing of the United States. In microscopy and astronomy he did excellent work, and his labors were recognized by the conferring of honorary degrees from many universities.

The seeds of the alfalaria are gathered by the ants in Southern California, in considerable quantities, judging from the hulls which they pile around the openings to their nests.

The Century for June contains an interesting and instructive illustrated sketch of an "American Amateur Astronomer," Mr. Burnham, formerly of Chicago, now of the corps at the Lick Observatory.

Among the articles in *St. Nicholas*, for June that will interest young naturalists, is one by Anna Botsford Comstock, on "Hidden Homes." Prof. H. H. Ballard, President of the Agassiz Association, also contributes a suggestive paper on "Amateur Photography."

Shells For Sale by C. R. Orcutt, San Diego, Calif.

- Acmaea, Esch.**
 15. .depicta, Dall
 20. .insessa, Hds
 05. .mesoleuca, Mke
 15. .paleacea
 05. .pelta, Esch
 10. .var. elevata, Orcutt
 05. .testudinalis
- Acus, Humphrey.**
 50. .aureola, Gray
 25. .caerulescens, Lam
 25. .crenulata, L
 20. .denudata
 05. .dislocatus, Say
 20. .maculata, L
 20. .strigillata, Gray
 20. .subulata, Lam
- Adeorbis, Wood.**
 25. .subcarinatus, Mont
- Adula, H. & A. Adams**
 20. .falcata, Gld
 15. .stylina, Cpr
- Alexia, Leach.**
 10. .personata, Midd
 05. .setifer, Cooper
- Alvania.**
 20. .aequisculpta, Cpr
- Amalthea, Schum.**
 50. .conica, Schum
- Amiantis, Cpr.**
 1.00. .callosa, Conr
- Amnicola, Gld. & Hld.**
 05. .cincinnatensis, Anth
 10. .cubeniana, D'Orb
 05. .decisa, Hld
 05. .grana, Say
 05. .negra, Say
 05. .lapidaria, Say
 05. .limosa, Say
 15. .longinqua, Gld
 05. .lustrica, Say
 10. .pallida, Hld
 20. .panamensis, Tryon
 05. .parva, Lea
 05. .porata, Say
 25. .sp. indet, Utah
- Amphibola, Schum.**
 20. .fragilis, L
 12. .nux-ave-lana, Chem
- Amphissa, H. & A. Ad.**
 10. .co.rugata, Rve
 10. .versicolor, Dall
- Ampullaria, Lam.**
 50. .chiqintensis, D'Orb
 1.00. .cumingii, Sby
 2.00. .olivacea, Spix
 50. .scalaris, D'Orb
- Amycla, H. & A. Ad.**
 05. .carinata, Hds
 10. .var. hindsii, Rve
 15. .chrysalloidea, Cpr
 10. .gausapata, Gld
- Anachis, H. & A. Ad.**
 10. .coronata, by
 10. .fluc uata, Sby
 10. .guatamalis, Sby
 10. .pencilata, Cpr
 20. .pygmaea, Sby
 20. .rugosa, Sby
 20. .rugulosa, Sbv
 20. .subturrita, Cpr
 20. .varia, Sby
- Ancillaria, Lam.**
 50. .acuminata, Lam
 15. .ampla, Gmel
 20. .candida, Lam
 20. .cinnamon a, Lam
 15. .fulva, Swains
 75. .glabrata, Swains
 2.00. .montronzieri, Sby
 15. .rubiginosa, Swains
 40. .tankervillei, Sby
 40. .torosa, Mensch
 20. .vesicula, Gmel
- Anapa, Gray.**
 50. .triquetra, Hawley
- Anculosa, Say.**
 10. .ampla, Anthony
 05. .plicata, Conr
 10. .rubiginosa, Lea
- Ancylus, Geoffroy.**
 05. .fluviatilis, L.m
 20. .lacustris
 15. .rivularis
- Angitrema, Hald.**
 50. .angulata, Wetherby
- Angulus, Schum.**
 10. .gouldii
 10. .mo testus
 10. .obtusus, Cpr
 15. .variegatus
- Anodonta, Cuvier.**
 2.00. .bridgesii, Lea
 50. .ca iforniensis, Lea
 1.00. .corpulenta, Cp
 50. .cygnaea, L
 1.00. .var inflata
 1.00. .var. limpida
 50. .edentula, Say
 75. .ferusaciana, Lea
 25. .fluviatilis, D.liw
 1.00. .grandis
 2.00. .jewettii, Lea
 50. .oregonensis, Lea
 1.00. .wahlamensis, Lea
- Anomia, L.**
 20. .aculeata, Gmel
 10. .ephippium, L
 25. .glabra Verrill
 25. .lampe, Gray
- Aporrhais, Dillw.**
 25. .occidentalis, Beck
 25. .pes-pelecani, L
- Asaphis.**
 25. .deitorata, L
- Arca, L.**
 20. .americana
 15. .incongrua
 30. .mutabulis
 15. .noae, L
 30. .ponderosa Say
 30. .solida, B & S
 30. .tetragona
 30. .virescens, Rve
- Assiminea, Leach.**
 10. .californica, Tryon
- Astarte, Sby.**
 15. .castanea, Sby
 25. .conradi, Shuttl
 25. .equimalti, Baird
 15. .sulcata, Da Costa
- Astyris, H. & A. Ad.**
 10. .aurantiaca, Dall
 10. .chrysalloidea, Cpr
 10. .tuberosa, Cpr
 10. .varie.ata, Stearns
- Atys, Montfort.**
 20. .cylindrica
- Auricula, Lamarek.**
 50. .parva, Swainson
 50. .aurismidae, L
 25. .elongata, Parr
 05. .fasciata, Desh
 25. .solida, Swainson
- Avicula, Lam.**
 25. .brevicauda, Desh
 20. .hirundo, L
 20. .margaritifera, Brug
 25. .tarentina
- Axinaea, Poli.**
 50. .maculata, Brod
- Bankivia, Beck.**
 10. .varians, Beck
- Barlecia, Clark.**
 10. .halictophila, Cpr
- Bithynia, Gray**
 15. .leachii, Shep
 05. .tentaculata, L
- Bela, Gray.**
 20. .brachystomoides
- Bittium**
 05. .filosum, Gld
 10. .lawleyanum, Crosse
 05. .nigrum, Tottem
 15. .quadrifilatum, Cpr
 05. .reticulatum, DC
 05. .scabrum, Olu
- Blauneria, Shuttl**
 1.00. .pellucida, Pfr
- Bryophila, Cpr**
 15. .setosa, Cpr
- Buccinum, L**
 25. .glacialis
 20. .undatum, Lam
 25. .undulatum, Moll
- Bulinnea, Hald**
 25. .megasoma
- Bulinus, Adams**
 10. .hypnorum, L
- Bulla**
 20. .Adamsi, Mke
 20. .ampulla, L
 15. .occidentalis, Adams
 20. .solitaria, Say
Busycon, Bolten
 50. .perversum, L
- Caecum, Flem**
 10. .californicum Dall
 25. .crebricinctum, Cpr
- Calliostoma, Sun**
 50. .annulatum, Mart
 20. .canaliculatum Mart
 15. .costatum, Mart
 50. .gemmulatum
 50. .exiguus, Pult
 15. .striatus, L
 50. .tricolor
- Callista, Poli**
 25. .gigantea, Chem
 25. .maculata, L
 50. .lupisearia, L
- Callopoma, Gray**
 50. .fluctuosum, Gray
 50. .fokkesii, Jones
 25. .tessellatum, Reeve
- Calyptrea, Lam**
 30. .conica, Brod
 10. .chinensis, L
 50. .dilleyani, Gast
 20. .equestris
 20. .striata
- Cancellaria, Lam**
 35. .reticulata, J
 30. .similaris, Sby
- Cantharus, Bolten**
 50. .tineta, Conr
- Cardita, Brug**
 25. .affinis, Sby
 25. .floridana, Conr
 15. .sulcata, Lam
- Cardium, L.**
 50. .aculeatum, L
 2.00. .blandum, Gld
 50. .corbis, Mart
 10. .consors, Brod
 20. .islandicum
 50. .isocardia, L
 75. .magnum, Born
 25. .solidum, Muricatum
 15. .mortoni, Conr
 40. .norvegicum, Speng
 1.00. .paucicostatum, Sby
 25. .serratum, L
- Casmaria, H. & A. Ad.**
 50. .vibex, L
- Cassidula, Ferrussac.**
 50. .crassiuscula
- Cassis, Lamarek.**
 1.00. .abbreviata, L
 75. .eburneus, Brug
 50. .undatum, Mart
 50. .testiculus, L
 1.00. .tessellata
- Ceratisolen, Forbes.**
 1.00. .legumen, L
- Cerithidea, Swains.**
 20. .ambigua, C B Ad
 10. .californica, Nutt
 15. .decollata, Lam
 10. .icstoma, Pfr
 20. .mazatlanica, Cpr
 25. .montaguui, D'Orb
 25. .obtusata, Lam
 15. .ornata, Ads
 15. .pulchra, C B Ad
 10. .tubercularifornis, Say
 15. .tenuis, Pfr
 25. .varicosa, Sby
 15. .mammillata, Risso
- Cerithiopsis, F. & H.**
 15. .tuberculata, Mart
 15. .tubercularis, Mart
- Cerithium, Brug.**
 20. .carbonarium
 20. .echinatum, Lam
 05. .ferrugineum, Say
 10. .fasciatum, Wood
 10. .fasciatum, Risso
 10. .literatum, Born
 25. .maculosum, Kien
 20. .mamillatum, Risso
 10. .morus, Lam
 10. .muscarum, Say
 10. .nigiescens, Mke
 40. .nodulosum, Brug
 35. .obeliscus, Brug
 25. .polygonum, Sby
 20. .reticu atum, DaCosta
 05. .rupestre, Brug
 15. .scabrum
 10. .stercus-muscarum
 15. .var
 05. .septemstriatum, Say
 10. .sinuatum, Gmel
 20. .versicolor, C B Ad
 20. .violaceum
 25. .vulgatum, Brug
- Chama, L.**
 50. .acnella, L
 22. .arcinella, L
 25. .exogrya, Conr
 25. .macrophylla, Chemn
 20. .spinosa
 00. .sp indet Gu'f Cal
- Chemnitzia, D'Orb.**
 25. .castanea, Cpr
 25. .stylina, Cpr
 25. .tenuicula, Gld
 25. .toruata
- Chilina, Gray**
 1.00. .fluctuosa, Gray
 1.00. .fluviatilis, Gray
- Chione, Megerle**
 25. .californiensis, Brod
 20. .cancellata, L
 50. .dombei, Lam
 50. .granulata, Gmel
 40. .grata, Sby
 20. .paphia, L
- Chiton, L**
 50. .acuta, Cpr
 15. .apiculatus, Say
 20. .c nereus, L
 25. .decoratus
 20. .circulus
 20. .gemmei, Cpr
 25. .lamuginosa, Cpr
- Chamaea, H. & A. Ad.**
 1.00. .tunicata, Sby
 50. .hindsii, Gray
 30. .mertronsii
- Chamaea, H. & A. Ad.**
 1.00. .wassnenskii, Midd
 1.00. .stelleri, Midd
 50. .stokesii
 15. .lineata, Wood
 30. .rugatus
 70. .lignosa, Gld
 40. .merckii, Midd
 1.00. .acrior

Chiton, L.—Cont.

- .20...striatus
- .35...piceus, Gmel
- .50...cooperi
- .35...palmulatus, Cpr

Chlorostoma, Swains

- .10...ater, Lesson
- .10...argyrostomus, Gmel
- .15...aureotinctum, Fbs
- .15...brunneum, Phil
- .15...lineata, Da Costa
- .20...pfeifferi, Phil

Chrysodomus, Swain

- .15...dirus, Rve
- 1.00...kennicotti, Dall

Circe, Schumacher

- .25...divaricatus, Lam
- .50...gibba, Lam
- .35...rivularis, Born

Clypidella, Swainson

- 1.00...binaculata, Dall
- 1.00...callomarginata

Collonia, Gray

- .15...granulosa, Pse
- .25...vitiensis, Bar

Columbella, Lam

- .10...carnata, Hds
- .10...cribraria, Lam
- .20...concinna, Sby
- .20...duclosiana, Sby
- .15...flava, Lam
- .05...fulgurans, Lam
- .10...fuscata, Sby
- .10...gausapata
- .10...haemastoma, Sby
- .15...lunatia, Sby
- .20...lutea, Suoy
- .20...maculosa, Sby
- .20...major, Sty
- .05...mercatoria, L
- .10...nitida, Lam
- .20...obesa
- .20...paytensis, Lesson
- .05...rustica, L
- .10...scripta, L
- .15...scumpicata, Stea ns
- .20...strombiformis, Lam
- .20...semiconvexa, Lam
- .10...varians, Sby
- .20...versicolor, Sby
- .20...zebra, Gray

Cominella, Gray

- .50...costata, Suoy

Concholepas, Lam

- .25...peruviana, Lam

Conchelix, Swains

- .50...conicus, Schum

Conus, L

- .25...abbreviatus, Conr
- .30...achatinus, Chemn
- .75...amadis, Mart
- 1.00...ammiralis, L
- .20...arachnoides, Gmel
- 1.25...araneosus, Hwass
- .30...arena
- .40...arenatus, Hwass
- .50...archiepiscopus, Hw
- .20...aristophanes, Ducl
- 1.25...augur, L
- .10...aurantius, Hwass
- .30...australis, Lam
- 1.25...bandanus, Hwass
- 1.25...betulinus, L
- .50...capitaneus, Hwass
- .25...catus, Hwass
- .35...cedonulli, Brug
- .30...ceylonensis, Hwass
- .35...cinereus, Hwass
- 1.00...cingulum, Mart
- .20...concinnus, Brod
- 1.00...costatus, Chem
- .30...daucus, Hwass
- .30...distans, Hwass
- .40...eburreus, Hwass
- .75...figulinus, L
- .50...flavidus, Brug
- .25...floridensis, Gabb
- .10...franciscanus, Hwass
- .25...fuscatus, Born
- 1.00...gabrielii, Kr

- .50...generalis, L
- .60...geographus, L
- .40...gladiator, Brod
- .30...glans, Hwass
- .20...granulatus, Hwass
- .35...gubernator, Brug
- .25...hebraeus, L
- 1.00...hyena, Brug
- 1.25...imperialis, L
- .25...interruptus, Sby
- .30...lacteus, Lam
- .50...legnarius, Rve
- .50...lecinus, Brug
- .60...lineatus, Chem
- 1.00...literatus, L
- .30...lithoglyphus, Me-ch
- .50...livi us, Brug
- 1.50...maculatus, Sby
- .25...mahogani, Sby
- .50...marmoreus, L
- .25...mediterraneus, Brug
- 1.00...menontaroon, Ch
- .15...menotus, Brug
- .35...mies, L
- .25...miliaris, Hwass
- 1.00...millepunctatus, L
- .25...minimus, L
- .60...monile, Brug
- .20...mus, Hwass
- .25...musicus, Hwass
- .20...nebulosus, L
- .60...nussatella, Burg
- .25...nux, Brod
- .40...obesus, Brug
- .40...omaria, Brug
- .30...parius, Rve
- .50...papilionaceus, Brug
- 1.00...pealii, Green
- .25...planorbis, Born
- 1.00...princeps, L
- 1.00...prometheus, Hwass
- .25...proteus, Hwass
- .25...pulicarius, L
- .25...punctatus, Ch
- .25...puncticulatus, Hwass
- .50...purpurascens, Brod
- .20...pusillus, L
- .25...pusio, L
- .60...quercinus, Hwass
- .25...rattus, Brug
- .25...regularis, Sby
- .30...senator, L
- .30...spectrum, L
- .30...sponsalis, Chemn
- .50...spurius, Gmel
- .30...stereus-muscarum, Ch
- .40...stelatus, Rve
- .40...stramineus, Lam
- .75...striatus, L
- .50...sulcatus, Hwass
- .50...sunatensis, Lam
- .25...taemiatas, Br
- .35...tebra, Br
- .30...terminus, Sby
- .40...tessellatus, Brug
- .25...testudineus, L
- .60...textile, L
- 1.00...tiaratus, Brod
- .30...trigris, L
- .15...toratus, Br
- .50...tulipa, L
- .35...varius, Brug
- .20...venulatus, Hwass
- .30...vermiculatus, Brug
- .25...verrucosus, Brug
- 1.25...vexillum, Mart
- 1.00...victoriae, Rve
- .60...virgo, L
- .35...vitellus, L
- .25...vitulinus, Br
- 1.00...vulpinus, Brug
- Cooperella, Carp**
- .25...scintillaformis, Cpr
- Coralliophila H & A Ad**
- .50...costulata, Bld
- Corbicula, Magerle**
- .50...pusilla, Bourg
- Corbula, Brug**
- .15...contracta, Say
- .10...gibba, Olioet

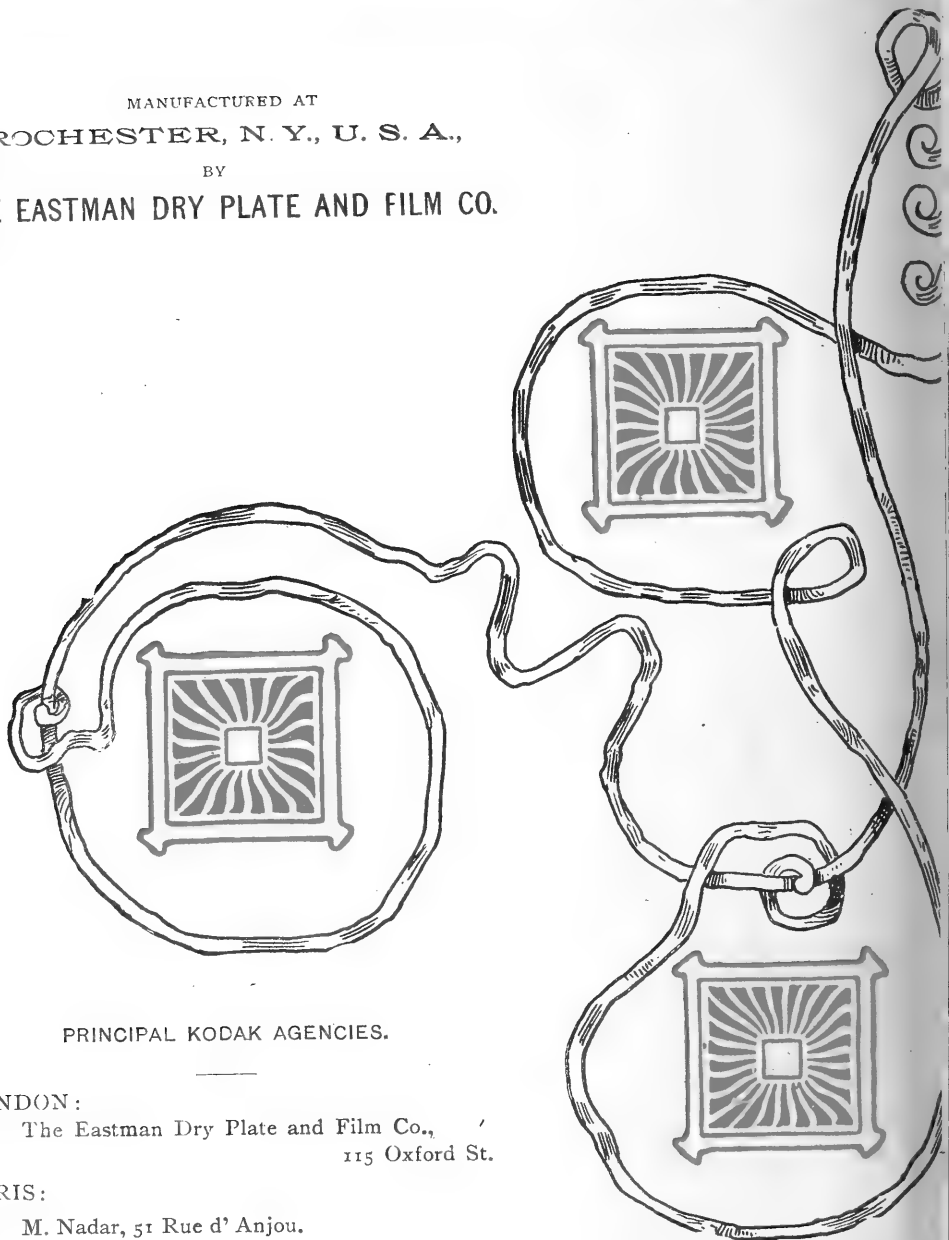
- .10...inoequivalois
- .20...lineolata, Say
- .15...nucleus, L
- Crassatella, Lam**
- .20...marginata, Cpr
- Crenella, Brown**
- .10...glandula, To ten
- .20...marmorata, Fbs
- Crepidula, Lam**
- .05...aculeata, Gmel
- .10...convexa, Say
- .15...dorsata, var
- .30...dilatata, Lam
- .15...elongata
- .15...excavata, Brod
- .10...fornicata, Gmel
- .10...marginalis, Brod
- .20...onyx, Sby
- .10...plana, Say
- .10...unguiformis, Lam
- Crucibulum, Schum**
- .35...corrugatum, Brod
- .20...trigonale, Ad & Rve
- .15...quinquim, Les
- Cryptogramma, Mch**
- .20...imprensa, Hanley
- .25...macrodon, "
- .25...squamosa, "
- Cuma, Humphrey**
- .25...coronatum, Lam
- .25...imperialis, Lam
- .25...kiosquiformis, Ducl
- .25...sacellum, Lam
- .25...tectum, Wood
- Cumingia, Clessin**
- .15...tellinoides, Coast
- Cyclas, Brug**
- .05...rivalis, Drap
- .05...rivicola, Leach
- .05...similis, Say
- .05...staminea, Con
- .05...transversa, Say
- Cymba, Brod**
- 1.00...neptuni, Gmel
- .25...porcina, Brod
- 1.00...proboscidiialis, Lam
- Cyprea, Linn**
- .15...abella, Lam
- .20...achatina, Soland
- .25...acicularis
- .50...adusta
- .10...albuginosa, Maw
- .50...amathystea, L
- .25...annulus, L
- .20...annulata, Gray
- .40...approximans
- .50...arabica, L
- .25...arenosa, Gray
- .75...argus, L
- .40...arenaria
- .40...armadina
- .10...asellus, L
- .15...angustata, Gmel
- .50...aurantium, Mart
- .25...arabulica, Lam
- .50...atomari, Gmel
- 1.00...australis, Gray
- 1.00...bartheleystii, Gmel
- 1.00...bicallosa, Gray
- 1.00...bicolor, Gask
- .50...boivini, Kien
- .15...caput-serpentis, L
- .75...carneola, Mart
- .25...caurica, L
- .50...cervus, L
- .15...cinerea, Gmel
- .20...clandestina, L
- .40...cruentata, Gmel
- 1.00...cervinetta, Kien
- .25...cruenta, L
- .25...cicerula, L
- .35...cibraria, Lam
- .50...chrysosema, Kien
- .15...citrina, Gray
- .50...clara, Gask
- .40...coffea, Gray
- .50...concava, Gray
- .25...childreni, Gross
- .25...contamina, Gray
- .30...controversa, Gray

- .20...candidula
- .20...costata
- .50...capensis, Gray
- .25...cervici, Sby
- .40...comptonii, Gray
- 1.00...cribellum, Gask
- .20...cylindrica, Born
- .75...cumingii
- .50...dubia, Gmel
- .35...eburnea, Bar
- .25...edentula, Sby
- 1.00...eglantina
- .15...erosa, L
- .25...errones, L
- .10...europea, Mont
- 1.00...exanthema, L
- .50...fasciata, Chem
- .50...felina, Gmel
- .50...flaveola, Lam
- .50...fimbriata, Gmel
- .50...ziagilis, L
- .50...zusca
- 1.00...gangerenosa, Dill
- 1.00...gemma, Mof
- 1.00...gooda li, Gray
- .75...gracilis, Gask
- .75...guttata, Gray
- .40...globosa, Kien
- .15...helvola, L
- .35...histrio, Kien
- .25...hirundo, L
- .30...isabella, L
- .25...insecta
- .30...interrupta, Gray
- .20...irrorata, Gray
- .50...intermedia
- .50...irina
- .35...amarckii, Gray
- 1.00...lurida, L
- .25...lynx, L
- .15...limacina, Lam
- .50...lentiginosa, Gray
- .50...lutea, Gmel
- .50...listerii, Gray
- 1.00...lathynis
- .50...madagascariensis, Gm
- 1.00...mauritiana, L
- 1.00...mappa, L
- .50...mus, L
- .20...moneta, L
- 1.00...maculata, Barnes
- 1.00...momialis, Lam
- .40...miliaris, Lam
- 1.00...menkiana, Desh
- 2.00...modesta
- 1.50...moosa, Brod
- 1.00...maueriae
- 1.00...macula, A. Ad
- 1.50...microdon, Gray
- 2.00...mappa, var rosea
- .25...neglecta, Sby
- .20...nucleus, L
- .30...nigropunctata
- .50...nymphii
- .25...nivea, Gray
- .20...nivosa, Sby
- .50...onyx, L
- .25...occelata, L
- .20...obveolata, L
- .20...obesa
- 1.00...oniscus
- .50...oryza
- .10...pulex
- 1.00...princeps
- 1.00...physis, Brocchi
- .40...pallida, Gray
- 1.00...pustulata, L
- .50...pantherina, Gray
- .30...picta, Gray
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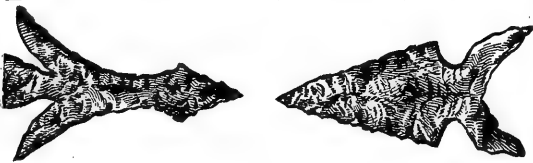
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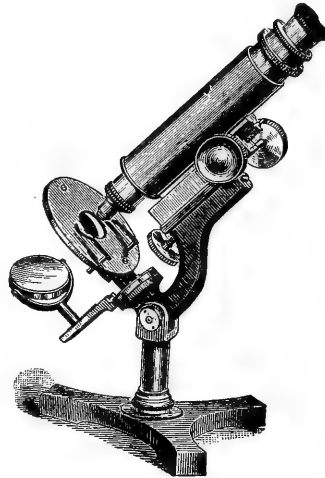
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THE WEST AMERICAN SCIENTIST.

VOL. VI.

AUGUST, 1889.

No. 46

DIAGNOSIS OF A NEW SPECIES OF SNAKE (*LICHANURA ORCUTTI*), FROM SAN DIEGO COUNTY, CALIFORNIA.

The snakes belonging to the superfamily, Boioideæ or Pero-poda, the "boiform" snakes characterized by the presence of rudiments of posterior extremities, are represented in the North American fauna by a few forms only. On the whole continent north of Panama there are only known about fourteen species belonging to seven genera, but of these only one species has hitherto been recorded from the United States, viz: *Charina plumbea*, B. and G., which ranges from Sonora to British Columbia. To this we may now add *Lichanura myriolepis*, Cope, which occurs in the neighborhood of San Diego, and a new species of the same genus, which I have named in honor of its discoverer, Mr. C. R. Orcutt. A detailed description with figures and comparison with allied species will shortly appear in the "Proceedings of the U. S. National Museum." The Assistant Secretary of the Smithsonian Institution in charge of the museum, Professor G. Brown Goode, has kindly permitted the following reprint of the diagnosis of this interesting species, copied from advanced sheets of the "Proceedings:"

"*LICHANURA ORCUTTI* sp. nov.

"Scales in 33 to 35 rows; eye encircled by 9 or 10 scales; loreals 4; labials 13-15; gasterosteges 232; anal entire; urosteges 45, entire.

"HABITAT:—Colorado Desert, San Diego county, California.

"TYPE:—U. S. Nat. Mus. No. 15503; C. R. Orcutt coll., April, 1889.

"Rostral plate very prominent, recurved, pentagonal, its nasal border twice as long as its labial.

"Of the forms which compose this genus the present species appears to be the most highly differentiated, the most distinctive feature being the elongation of the snout, and the prominence and shape of the rostral." *Leonhard Stejneger.*

SMITHSONIAN INSTITUTION, }
WASHINGTON, D. C., June 24, 1889. }

ON THE MEDICAL PROPERTIES OF SOME CALIFORNIA PLANTS.

Editor of the WEST AMERICAN SCIENTIST:—We beg to acknowledge receipt of your favor, and in reply thereto, we beg to state as follows: Conchalagua or canchalagua is, as you mention, the *Erythraea venusta*, Gray, but more popularly known as California Centaury, Californian Pink, etc.

Medicinally it possesses valuable antiseptic and febrifuge properties and is in high repute as a bitter tonic and stomachic, but we see no reason for considering it to be the "August Flower" so extensively advertised. [We have been informed that such was the case—EDITOR.]

In regard to the other plant mentioned by you, Golondrina, we find that several species of *Euphorbia*, mostly the *E. albomarginata*, Torr. and Gray, and the *E. prostata*, Ait., have acquired a reputation as antidotes for Snake poisoning, under the names of "Golondrina" and "Gollindrinera" [*E. polycarpa*, Benth. is the common Golondrina of the Mexicans of Southern and Lower California.—EDITOR.]

The latter name has been applied also to the *Chelidonium majus*, Linnè, and the *Euphorbia maculata*, Linnè, is known in some districts as Golondrina de Filipinas, or Gatas-Gatas de Filipinas. In the case of these last two plants however, we find no record of their having been employed as snake-bite remedies.

Larrea Mexicana, Moricand, is popularly known as the creosote-bush or stinkweed, and is credited with being possessed of valuable properties for the treatment of rheumatism and syphilitic diseases. Trusting that the above will be of interest, we are, very truly yours,
Parke, Davis & Company.

SOME NOTES ON THE TERTIARY FOSSILS OF CALIFORNIA.—II.

THE SAN DIEGO WELL.

In the early days of the present city of San Diego, California, a well was sunk to a depth of 160 feet, at the corner of Ash and Eleventh Streets, which for a time formed the source of the water-supply of the then small town. The depth reached was not far from the present sea-level, and it may be well to add that the well is situated at the mouth of one of the small canyons, opening out upon the lower mesa, upon which is built the business portion of our city of to-day.

Mr. Henry Hemphill, the indefatigable student and collector of our west coast mollusca, was then, as now, a resident of San Diego, and present to examine the debris as it was brought up from the well. At the depth of about ninety feet a stratum of

indurated sandstone was passed through, in which was found casts of various shells, together with a few well preserved fossil shells.

At a greater depth, from 140 to 160 feet, came a rich variety of well preserved shells imbedded in a usually rather soft matrix, composed of loosely aggregated grains of sand or fine sandy mud, occasionally hardened by infiltration of lime-bearing water.

The following is a list of the species obtained from this well by Mr. Hemphill, as they were identified and published in the Proceedings of the California Academy of Sciences, Vol. V, pp. 296-299, 1874, by William H. Dall.

- Glottidia albida, Hinds.
- Xylotrya sp. indet. (Tubes only.)
- Cryptomya Californica, Conr.
- Dentalium hexagonum, Sby.
- “ semipolitum, B. and S.
- Solen rosaceus, Cpr.
- Solecortus Californianus, Conr.
- Myurella simplex, Cpr.
- Macoma expansa, Cpr.
- Callista sp. indet. (smooth, thin and inflated. Much like C. Newcombiana.)
- Cardium centifilosum, Cpr.
- Venericardia borealis, Conr.
- Lucina Nuttallii, Conr.
- “ borealis, L.
- “ tenuisculpta, Cpr.
- Cryptodon flexuosus, Mont.
- Modiola recta, Conr.
- Arca microdonta, Conr.
- Nucula sp. n. Cpr. (like N. tenuis.)
- Acila Lyalli, Baird (frequently reported as A. castrensis, Hds.)
- Leda caelata, Hds.
- Pecten hastatus, Sby.
- Amusium caurinum, Gld.
- Janira florida, Hds.
- Ostrea conchaphila, Cpr.
- Placunanomia macroschisma, Desh.
- Tornatina eximia, Baird.
- Cylichna cylindracea, L.
- Siphonodentalium pusillum? Gabb.
- Calliostoma annulatum Martyn.
- Galerus filusus. Gabb.
- Crepidula navicelloides, Nutt.
- “ princeps, Conr. (not C. grandis of Midd.)
- Turritella Jewettii, Cpr.
- Bittium asperum, Cpr.

Drillia sp. indet.

“ “ “
 “ “ “
 “ “ “

Surcula *Carpenteriana*, Gabb.

Mangilia *variegata*, Cpr.

“ sp. indet.
 “ “ “
 “ “ “
 “ “ “

Clathurella *Conradiana*, Gabb.

Odostomia *straminea*, Cpr., var.

“ sp. indet.

Turbonilla *torquata*, Cpr.

Eulima *rutila*, Cpr.

Scalaria *subcoronata*, Cpr.

Cancellaria sp. indet.

“ “ “
 “ “ “
 “ “ “

Neverita *Reclusiana*, Petit.

Sigaretus *debilis*, Gld.

Ranella *Mathewsonii*, Gabb.

Olivella *boetica*, Cpr.

Nassa *fossata*, Gld.

“ *mendica*, Gld.

Astyris *tuberosa*, Cpr.

“ sp. indet.

Ocinebra *lurida*, Cpr.

Pteronotus *festivus*, Hds.

Trophon *orpheus*, Gld.

Fusus (*Colus*) *Dupetit-Thouarsi* ? Kiener.

Chrysodomus *Diegoensis*, Dall, n. sp.

“ n. sp (too imperfect to describe.)

The following additions to the list of species from this well were reported by Dall, Proc. U. S. Nat. Mus., 1, pp. 10-16:

Venericardia *monilicosta*, Gabb.

Janira *dentata*, Sby.

Cylichna *alba*, Brown.

Turritella *Cooperi*, Cpr., var.

Turbonilla *stylina*, Cpr.

Other additions to the list are incorporated by Dall (l. c. pp. 26-30) in substantially the same list as was published in the Proc. Cal. Acad. Sci., which I note as follows:

Clementia *subdiaphana*, Cpr.

Lucina *acutilineata*, Conr.

Nucula *exigua*, Sby.

Volutopsis sp. indet.

Mamma nana, Möller.

Cadulus fusiformis.

Pecten expansus, Dall.

The stratum from which these fossils came is probably at least seventy feet in thickness in places, and the bed is of wide extent as is shown by the fossils which have been found in nearly every well that has been sunk in San Diego.

The fossils from this San Diego well will be found of great importance in the study of both recent and fossil shells from other localities.

C. R. Orcutt.

THE OAK OF CUYAMACA.

[A MEMORY OF A CAMPING TRIP.]

A grand old oak of the mountains gave as
Free-hearted, both light and shade, and fuel;
Its sturdy boughs, rich draped with foliage,
Were a screen by day from the sun's red rays,
And at night, when moon and stars were o'er us,
The heart of the brave old tree was aglow
With flame, as if it would the stars outvie
In beautiful play of color and light.
For fire was kindled its branches beneath,
And its grand trunk, as a chimney-back served,
And seemed destruction to defy;
From its radiant glow, the night winds caught
A genial warmth, and with magic power
Diffused the sweetness of repose around
The tired traveller, and restful slumber
Brought unto the weary-eyed.
Thus, a shade by day and a light by night,
Like the pillar of fire and the cloud, that
For a favored race, from bondage led the way,
Was the grand old oak in its majesty.
With all our thoughts of beauty and grandeur,
The memory of that mountain monarch
Of the woods, is cherished and treasured now. *E.E.*

SOME BEETLES OF SAN DIEGO COUNTY CAL.

[The following is a list of some beetles collected on the Colorado desert and in the vicinity of San Diego city, during April and May, 1889, by the editor. Our field notes as to the host plants, exact localities, and date of capture were unfortunately lost.

EDITOR.]

Calosoma peregrinator.
Eleodes armata.
" *acuticauda.*

Cotalpa ursina.
Saprinus lugens.
Podabrus comes.

Necrophorus nigritus.	Telephorus ingenuus.
" marginatus.	Leptura sphæricollis.
Cantharis magister.	Creophilus villosus.
" lugubris.	Platynus cupreus.
" smaragdula.	Silpha ramosa.
Calospasta perpulchra.	" opaca.
Phodaga alticeps.	Cysteodemus armatus.
Epicauta puncticollis.	Megetra opaca.
Tetraopes femoratus.	Telephorus consors.
Argoporis bicolor.	Trichodes ornata.
Cerenopus concolor.	Scyphophorus yuccæ.
Dermestes mannerheimi.	Chrysochus cobaltinus.
Pterostichus lustrans.	Hippodamia convergens.
Cycloneda abdominalis.	Gastrophysa cæsia.
Haltica carinata.	Carpophilus pallipennis.
Pristoscelis suturalis.	Schizopus lætus ♂ & ♀
" sordidus.	Hololepta yuccateca.

L. O. Howard.

U. S. NATIONAL MUSEUM, JUNE 11, 1889.

THE TREES OF BRITISH COLUMBIA.

(For the WEST AMERICAN SCIENTIST.)

The great island of Vancouver, the largest isle on the west coast of America, surrounded by many satellites of smaller order, especially in the Strait of Georgia, and the mainland of the province, compare favorably in respect of forests, to any State, province or country, either in North America or in Europe. This great and magnificent province of British Columbia, now brought into communication with eastern parts of the Dominion through the Canadian Pacific Railway, contains such a variety of plants from the magnificent Douglas fir to the modest cow-slips that the future botanist of British Columbia, will find here a most luxuriant field for study.

The short account of some of the trees and other plants given here is written with the purpose that the numerous readers of the WEST AMERICAN SCIENTIST may form an idea of the magnitude of botanical life in this remote province. The writer of these lines has been but a short time in British Columbia, consequently the account of plants will be found to be very incomplete; still the author will endeavor to present as many facts as possible, either from his own observations, or from those gathered by the Government Department of Agriculture.

In the province of British Columbia the Coniferæ are to be found in great profusion. Among them the first place belongs to the Douglas Spruce, sometimes called Douglas fir, Douglas pine, and Oregon pine (*Pseudotsuga Douglasii*), a magnificent tree, often over 250 feet high and 30 feet in circumference, and whose bark is sometimes 9 or 10 inches in thickness. This tree grows very rapidly, and is divided by the woodman into two kinds, yellow and red. The first has a reddish-yellow, knotty

heart, and is less durable than the red one. *Pseudotsuga Douglasii* grows mostly in the southern parts of the province, also on the mainland coast and on Vancouver Island, but is not to be found on Queen Charlotte Islands.

Menzies' or Western Spruce (*Picea Sitchensis*), very similar to the *Pseudotsuga Douglasii*, grows chiefly on the coast, and is found also in the Gold and Selkirk ranges. The wood is white, and the tree grows to a very large size.

The Western Hemlock or Hemlock Spruce (*Tsuga Mertensiana*) occurs on the coast, also on Fraser river and the Selkirk and Gold ranges. On Queen Charlotte Islands it reaches the height of 200 feet. Its timber splits obliquely, and decays in the atmosphere, but the bark is very valuable for tanning.

Engelmann's Spruce (*Picea Engelmanni*) occurs in the eastern and interior parts of the province, and forms dense forests in the mountains to the level of nearly 4,000 feet in elevation. The tree is very tall and straight, and the wood durable.

The Great Silver or Western White Fir (*Abies grandis*) clings to the coast, but reappears also in the southeast of the province. It is a large tree, but the wood is soft. *Abies amabilis*, a species most resembling it, grows in the valley of the Fraser river, and on Silver Mountain, Yale. This tree is in some cases confounded with *Abies Subalpina* or Mountain Balsam.

The Mountain Balsam (*Abies Subalpina*) is found in the Gold and Selkirk ranges, in the Rocky Mountains, and in the northern portion of the interior plateau; sometimes in localities nearly reaching 4,000 feet in elevation.

The Mountain Weymouth or Western White Pine (*Pinus monticola*) is found in the Columbia River region, and also in the interior of Vancouver Island. It makes excellent masts, and its wood resembles that of the eastern white pine.

The so-called White-barked Pine (*Pinus albicaulis*) is a small tree, and grows at a very great elevation. Not always distinguished from this species is *Pinus flexilis*, the Rocky Mountain Pine.

The Yellow Pine, sometimes called red, and pitch pine, is *Pinus ponderosa*, var. *scopulorum*. It is a magnificent tree, remarkable for the heaviness of its timber. Its bark is reddish-brown, and half the shaft branchless. It is found in the dry regions of the mainland, and on the slopes up to 3,000 feet.

The Scrub Pine (*Pinus contorta*) is a coast tree, and grows on sandy dunes and rocky points. The "interior" variety of this tree, the so-called Black Pine (*Pinus Murrayana*) extends further north than any other pine; it covers great areas of poor soil, and sometimes is found on the hills over 3,500 feet high. In the interior of British Columbia, the trees are 100 feet in height, but their diameter is only about two feet.

The Western Cedar, also called red or giant cedar, (*Thuja gigantea*) abounds on the Columbia river, on the Gold and Sel-

kirk ranges, along the coast, and also in the northern interior. It is a stupendous tree, sometimes 150 feet high and 15 feet thick, generally hollow. The wood is reddish-yellow, and splits easily into plank, and is used for shingles. The Indians use it for canoes, and out of its fiber they weave their blankets.

The Yellow Cypress, commonly called yellow cedar, (*Thuja excelsa*) grows principally on the coast, also in the interior of Vancouver Island and on the west coast of Queen Charlotte Islands. It is of a pale-yellow tint, and has a strong resinous smell, so that the voracious toredo will not attack it. It is used for ornamental purposes, and also for boats, and the Indians use it for making their carved totem-stick.

The Red American Larch or Western Tamarack, (*Larix occidentalis*) is a noble tree, and its timber is highly valued. It occurs in the interior, on the Gold and Selkirk ranges, and in the Rocky Mountains.

The Mountain Larch, (*Larix Lyallii*) grows in the Cascade and Rocky Mountains, and forms the last belt of timber above 7,000 feet high. There is a third species of larch in British Columbia, the Black Larch (*Larix Americana*), which grows in the Rocky Mountains, in the Peace River region. It is a very small tree. The Juniper, or Western Red Cedar, (*Juniperus occidentalis*) abounds in the Columbia Valley, on the east coast of Vancouver Island, and also along the shores of the lakes in the interior. The Common Juniper (*Juniperus communis*, var. *Alpina*) is found from the Rocky to the summit of the Selkirk Mountains.

Among other trees, valuable as hardwood, the most important is probably the Maple (*Acer macrophyllum*), found on Vancouver and Queen Charlotte Islands, and also on the mainland coast up to 55°. It is a magnificent tree, and grows to a very large size. The Vine Maple (*Acer circinatum*) yields strong, white wood, suitable for helms. It is very common in the valley of the Fraser River, on the west coast, and on Vancouver Island. The Torrey (*Acer glabrum*) grows chiefly on the west side of the Rocky Mountains, about the sources of the Columbia and on Vancouver Island. The Yew (*Taxus brevifolia*) occurs on Vancouver Island, in the vicinity of Fraser River, and sparingly on Queen Charlotte Islands. The wood is tough and of beautiful rose color. The Alder is abundant everywhere in the province. The Western or Red Alder (*Alnus rubra*) is a large tree in the valley of the Fraser River, and in the coast ranges and islands. The Mountain Alder (*Alnus rhombifolia*) is common in the southeast of the province, the Common Alder (*Alnus incana*, var. *virescens*) in the Rocky Mountains, and the Green Alder (*Alnus viridis*) in the northern districts of the province. The Crab or Wild Apple (*Pirus rivularis*) occurs in the valley of the Fraser, on the coast, and on Vancouver and Queen Charlotte

Islands. Its wood takes a good polish. From the Birch family we find the Western Birch (*Betula occidentalis*) very common in the Columbia Valley. The Dwarf Birch (*Betula glandulosa*) a small shrub, abundant all over the mainland; and the Canoe Birch (*Betula papyrifera*) which grows on Vancouver Island and in the region of the Fraser and Peace rivers. It is used by the Indians for baskets, boxes, canoes, etc.

Except a few small trees, a mile and a half above Yale, on the Fraser, the only oak in the province is the Western White Oak (*Quercus carryana*), which is found on Vancouver Island, chiefly in its southeastern part. It is sometimes seventy feet high and three feet in diameter, though many of the trees are scrubby. The Westering Flowering Dogwood (*Cornus nuttallii*) is very common in the neighborhood of Yale and around Victoria, Vancouver Island. *Cornus pubescens* is abundant also at Victoria and in the Fraser River valley. The wood of the dogwood, or dogberry as it is sometimes called, is used for inlaying and ornamental work. The Arbutus or Madrona (*Arbutus menziesii*), sometimes fifty feet high and twenty inches in diameter, is chiefly found on Vancouver Island and neighboring isles; in the vicinity of Victoria, on the Esquimalt road, the arbutus is very common. It is a beautiful tree, with evergreen leaves and reddish bark. The Bearberry (*Arctostaphylos uva-ursi*) is a small trailing and evergreen shrub, growing in dry and rocky places, chiefly in the northwest of the province. The berries are mealy and form a principal part of the food of bears, grouse and prairie chickens. *Arctostaphylos tomentosa* grows in dry and rocky localities of southern British Columbia and on Vancouver Island.

From the Poplar family, the American aspen or Tremulus poplar (*Populus tremuloides*) abounds in the interior, and also in the north. It reaches sometimes a thickness of two feet. The other varieties of poplar in British Columbia are commonly called the cottonwood. *Populus trichocarpa* is common in Columbia and Fraser River valleys. *Populus monilifera* and *Populus balsamifera* are to be found in the northern and north-eastern parts of the province, and also in the valley of the Lower Fraser.

Herewith I conclude this article on some of the trees in British Columbia. It is only a general outline I give to the readers of the WEST AMERICAN SCIENTIST, though at some future time I intend to furnish a careful description of all the plants, if possible, which are to be found in this magnificent province. M. LOPATECKI.

BRIEFER ARTICLES.

PRESENTIMENTS—From an article by Rev. J. M. Buckley in the *July Century* on "Presentiments, Visions and Apparitions" we quote the following: "Since that experience, in many voy-

ages I have made it an object to inquire of travelers and others concerning presentiments, and have found that they are very common, occasionally fulfilled, generally not so; and that it is the tendency with practically all persons who have had one presentiment come true to force themselves into all, and to become tyrants over those dependent upon them or those traveling with them. It is to be frankly admitted that no matter how vivid the supposed presentiment might be, its non-fulfillment would not demonstrate that there are no presentiments which must have originated external to the mind of the subject; but having been led by my experience to induce many persons to defy such feelings without a single instance of reported evil results, it confirms strongly the hypothesis of their subjective origin.

“That presentiments are governed by no moral principle in the character of the subjects to which they are applied, the persons who receive them, the occasions upon which they are given, and their effects, is apparent. The most immoral have claimed to have them, have communicated them to others, and they have sometimes been fulfilled by events from which the persons having them have derived great personal advantages. The best of men have had presentiments, but the great majority of good people have not; and the greatest calamities which have befallen most persons have come without any warning whatsoever, except such as could be inferred from existing situations. Experience, foresight and guidance by ordinary sagacity have been all that mankind have had to rely upon; and to be governed only by these, combating or disregarding presentiments, impressions and powerful impulses for which no foundation can be found in the nature of things, is the only safe and stable rule.

ENCOURAGING SCIENCE—The Vermont Microscopical Association has just announced that a prize of \$250, given by the Wells & Richardson Co., the well-known chemists, will be paid to the first discoverer of a new disease germ. The wonderful discovery by Professor Koch of the cholera germ, as the cause of cholera, stimulated great research throughout the world, and it is believed this liberal prize, offered by a house of such standing, will greatly assist in the detection of micro-organisms that are the direct cause of disease and death. All who are interested in the subject and the conditions of this prize, should write to C. Smith Boynton, M. D., Secretary of the Association, Burlington, Vt.

RECENT AND SUB-FOSSIL SHELLS OF THE COLORADO DESERT—In crossing the basin of the Colorado Desert in June, 1888, the editor made a considerable collection of the fresh water shells, in a sub-fossil state that are found strewn in such numbers over portions of the desert. *Amnicola protea*, Gould, was found by the million, and several quarts of this small shell were easily gathered—scraped up off the ground where the wind had blown them together. With them were numerous specimens of *Amni-*

cola longinqua, Gould, *Anodonta Californiensis*, Lea, and a species of *Physa* and *Planorbis* were also abundant.

At Salton, 250 feet below sea level, we were greatly surprised to find numerous valves of *Solecortus Californianus*, Conr., along with the fresh water shells. It is a difficult problem to solve how both marine and fresh water shells, apparently of the same age should be found together at this place. A few miles away a single valve of an indeterminable marine shell was also found, and Dr. R. E. C. Stearns reports finding not only *Solecortus*, but also a single specimen of *Ocenebra Poulsoni* at Indio, a station on the Southern Pacific Railway, a few miles west of Salton. It will be necessary to study the topography of the whole region very carefully before it will be safe to form theories based on these facts.

In a spring at Dos Palmas the *Physa* and *Amnicola protea*, Gould, were both found living in water at about eighty degrees of temperature. *Anodonta Californiensis*, Lea, has been found living in Arizona, and is reported also from the Mohave River in the Mohave Desert. We may expect to find it therefore in some portion of the Colorado Desert when that region is more fully explored.

The miocene beds along Carisso Creek furnish marine forms in great abundance, but are of a different age and formation from the fossils obtained at the above locality. *C. R. Orcutt.*

ANTS IN GARDENS.—Regarding the damage done by ants in gardens and seed beds, the remedy depends to some extent upon the species of ant and its method of work and manner of living. If it is a species which nests in the ground, it can best be attacked with bisulphide of carbon. Pour a table-spoonful into each of several of the orifices, covering the nests with a wet blanket, and after ten or fifteen minutes exploding the vapor at the mouths of the holes by means of a long handled torch.

L. O. Howard, Acting Entomologist.

UNITED STATES DEPARTMENT OF AGRICULTURE }
Division of Entomology, }
WASHINGTON, D. C. JUNE 28, 1889. }

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

San Francisco Microscopical Society, June 26, 1889.

President Payzant occupied the chair. Frank E. James, M. D. and Professor H. M. Whelpley of St. Louis were present as visitors; also, M. R. Roberts of San Francisco and L. M. King of Santa Rosa.

The President announced, with regret, the death of F. L. Howard, for many years a member of the society.

Dr. James, who is attending the convention of the American Pharmaceutical Association in this city is well known to all microscopists by his able contributions to this branch of science. He gave an interesting account of a phenomenal class of crystals produced from salicine by the extreme cold method as discovered by him several years ago, and exhibited a series of slides with the polariscope, which were pronounced by all to be the most beautiful crystallizations ever seen. The process depends on bringing a saturated solution of salicine made with distilled water in contact with cold below the freezing point, and Dr. James' explanation is, that the rapid congelation of the water interferes with the usual arrangement of the crystals, producing the wonderful series before alluded to, which are entirely unlike any forms resulting from crystallization at the ordinary temperature. The proper manner of making white zinc cement and permanent oxydized enamels for ringing slides formed a portion of his interesting contribution to the meeting.

H. M. Whelpley of the St. Louis Microscopical Club also addressed the society on the subject of the microscope in its relation to pharmacy, pointing out the rapid progress being made in the detection of adulterations and the interest manifested generally among pharmacutists in studying the character and acquiring a correct knowledge of the crude constituents of the *materia medica*.

Pond life was illustrated by numerous specimens of *Ceratium longicornis*, and the beautiful little organism, *Artemia salina*, or brine shrimp. Entomology was represented by prepared slides of the larva of several varieties of the *Papilio* family.

Professor Hanks presented for examination a venerable edition of a work on Pharmaceutics published by Robert Lowell in 1661.

Mr. Riedy donated a copy of Trembley's work on fresh water Polypes, an exceedingly rare and valuable book, published in 1744.

C. P. Bates, Rec. Sec.

BIBLIOGRAPHY.

ANTHONY WOODWARD.—Preliminary list of foraminiferae from the post-pliocene sand at Santa Barbara, Calif., *Journal of the N. Y. Micro. Soc.*, Jan, 1889. Twenty-eight species are given.

WYOMING'S RESOURCES.—An official publication, compiled by the Secretary of the Territory, has been issued as a guide for home seekers to the vacant public lands and contains descriptions of soil, climate, productions, topography, minerals, etc. *Cheyenne, Wyo. T.*, 1889. 78 pp. 8 vo. ill.

R. W. SHUFELDT.—Observations upon the development of the skull in *Neotoma fuscipes*; a contribution to the morphology of the rodentia. *Proc. Acad. Nat. Sci. of Phil.* 1889. pp. 14-28. two colored plates. From the author.

RICHARD CHENEVIX TRENCH D. D.—English Past and Present. Humboldt Pub. Co., 28 Lafayette Place, New York. Nos. 108 and 109 of the Humboldt Library. This is another standard work added to the Humboldt Library Series—a work that has had a sale second only to “THE STUDY OF WORDS” by the same distinguished author. Twenty editions of the latter and thirteen of the former, are the best evidences of the popularity of the works. The English language is spoken in almost every country of the globe, and seems destined to be the universal language of the next century. It was the language used at the late conference in Berlin, supplanting French, until now the language of diplomacy. A most interesting study, therefore, is the history of the English language past and present.

THE ENGLISH SPARROW (*Passer domesticus*)—Bull. 1, Division of economic ornithology and mammalogy, U. S. Dept. Agric. Prepared by W. B. Barrows, 1889. This work of over 400 pages shows how rapidly this bird has spread throughout the Eastern United States, and presents the larger portion of the literature written from different stand points relative to its introduction. It as yet has gained but a small foothold on this coast, where it is confined mainly to the vicinity of San Francisco.

C. H. EIGENMANN—On the development of California food fishes. *Amer. Naturalist*, XXIII, 107-110.

H. R. TAYLOR—Nesting of the white-tailed kite. *Ornith and Oologist*, xiv, 90.

E. D. COPE—On the mammalia obtained by the Naturalist exploring expedition to Southern Brazil. Extracted from the *American Naturalist*, February, 1889.

The vertebrate fauna of the Equus beds. Extract from the same. Gives a list of the species found in the Oregon Desert, (2) in the country of the Nueces, S. W. Texas, and (3) in the valley of Mexico.

EDITORIAL.

The tin mines of the United States are beginning to attract the attention of both American and foreign capital. The annual importation of tin in the United States exceeds \$21,000,000; while vast deposits of ore exist in California, Nevada, Dakota and Texas, awaiting development. Several large English syndicates, and also a heavy Chicago company, are now preparing to make these mines produce the tin consumed in this country.

The editorial association of Southern California held its mid-summer convention in San Diego on the 9th, 10th and 11th of July, devoting the days to excursions in the vicinity of San Diego and the evenings to business sessions. The 9th we participated in a pleasant excursion from Hotel del Coronado over

the Coronado Railway to National City and thence to the Mexican boundary in the Tijuana valley, where the ladies received the official stamp of the Mexican customs on their handkerchiefs. Returning, a beautiful spread of fruits and flowers, and more substantial edibles, provided by the ladies of National City, was found awaiting us under the olive trees of Mr. Warren Kimball, to which ample justice was done. On the 10th an excursion around San Diego bay in the steamer Manuel Dublan was enjoyed through the courtesy of Capt. Scott. The 11th, the association visited El Cajon and Lakeside, viewing a section of the famous San Diego flume and the orchards and vineyards of the valley.

A report of a discovery of a member of the great boa constrictor family having reached the daily press, our friends rather cruelly hint that we are in the habit of "seeing snakes." Such is fame!

Dr. Stephen Bowers, of the California Mineralogical and Geological Survey, was in attendance at the editorial convention, and we had the pleasure of making his personal acquaintance. He recently visited the Colorado Desert at Indio, where a new species of *Helix* in a sub-fossil condition was found among the granite boulders of the hills. A still more important discovery was made by the doctor in his ethnological researches on the side of the San Jacinto mountain at the edge of the ancient lake. His Indian guide here pointed out to him numerous stone "fish-traps," made by the ancestors of the present race of Indians. We hope to give our readers soon a more detailed description of this interesting discovery.

The kindly words of the editor of the *Standard* of Chicago, one of the leading religious weeklies of America, showing an appreciation of our work upon the *SCIENTIST*, are very gratifying to our vanity. We shall hope and strive to merit all the praises of our contemporaries, but we have not yet been able to present our *ideal* magazine. We must look to our contributors and correspondents for friendly criticism and assistance in making the *SCIENTIST* all that its friends would desire.

NOTES AND NEWS.

Henrich Gustav Reichenbach died at Hamburg, Germany, May 6th, at the age of sixty-five. He was the recognized authority on orchid nomenclature, and was widely known for his extensive knowledge and writings on orchids, to the study of which he devoted a great portion of his life. Reichenbachia, the sumptuous periodical devoted to orchids, was named for him and he was connected with it at the time of his death.

Charles Fasoldt, the well-known maker of clocks and scientific

apparatus, died at his home in Albany, N Y, May 13th, aged seventy years. He was born in Dresden, Saxony, February 23d, 1819.

Professor Walley states as his belief that tuberculosis might be transmitted by fowls' eggs.

The foundation walls of the front building of the Academy of Sciences are now completed, so that work on the superstructure of both front and back buildings is now in progress.— *Building Advertiser*, San Francisco, June, 1889.

The *California Florist and Gardener* has been consolidated with the *Pacific Rural Press*.

"Our Greatest Inventor" is the title which John Habberton gives to a comprehensive article upon Ericsson in the July number of the *Lippincott's Magazine*. The builder of the Monitor, and the inventor of the propeller and the caloric engine, has certainly great claims upon the gratitude not only of this country but of the world.

An instructive article upon "Farming among the Pueblo Indians," describing the primitive methods of agriculture and the happy-go-lucky manner of life among that ancient Indian tribe, is given in the *American Agriculturist* for July. A quaint illustration shows the buildings of a Pueblo Indian community at Taos, New Mexico, the houses joined together, even built one on top of the other, having few windows and doors and generally entered through the roof by a ladder—just as their ancestors built their homes centuries ago. Their farming methods are equally behind the times, but are carried on in a manner fully satisfactory to themselves.

Dr. Edward Palmer has been severely sick at the hospital of the Good Samaritan in San Diego. His friends will be glad to learn that he is better at this writing.

The Department of the interior, Census Office, Washington, D. C., requests all members of the medical professions to apply for physician's registers, now ready. Every M. D. should assist in furnishing the statistics called for, and should apply at once.

The only way to identify the nest and eggs of any small bird is to shoot either parent. This is especially true of humming-birds.

L. Belding.

Dr. Eigenmann reports an earthquake at San Diego at 3 A. M. June 25th.

Dr. Parry has been visiting the Lemmon herbarium at Oakland.

Dr. Harkness, president of the California Academy of Sciences, recently visited San Diego.

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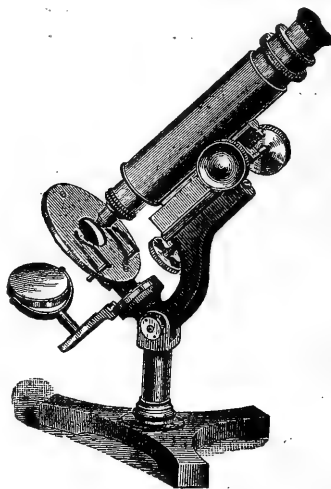
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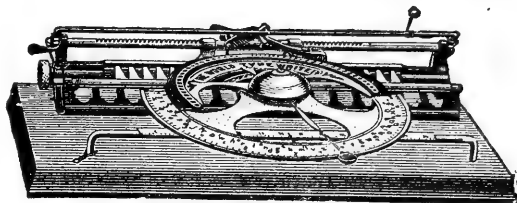
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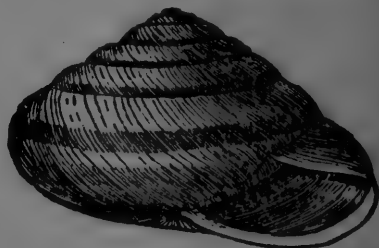
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SEPTEMBER, 1889.

No. 47

THE CALIFORNIA GEYSERS.

The remarkable hot springs, which are commonly called by the above name, are situated in the north-easterly part of Sonoma county, some twenty miles from the southern extremity of Clear lake. The writer recently visited this spot, and so greatly enjoyed both the journey and the scenery that he would fain induce hundreds of others to go and do likewise.

To reach the Geysers is not a difficult undertaking. We will suppose you are in San Francisco and that you come to the ferry at half-past seven in the morning. Step on board the large ferry-boat "Tiburon," take a comfortable seat on the upper deck, and in a few moments the journey will begin. The whistle blows, the wheels revolve, the rudder directs the course of the boat to the north, and you are swiftly speeding past the city front with its crowded wharves and ware-houses and in a little time are feeling the gentle swell which comes in through the Golden Gate. On past Alcatraz, with its ramparts and its guns, and you are soon skirting along the western side of Angel Island. In a little hollow which comes down to the water's edge is the military settlement, and there may be seen barracks, officers' houses and store buildings prettily grouped around a central park, while on the side of a hill stands a little church, nestling among the oaks, and above this may be seen the white stones and crosses which mark the last resting places of soldiers who have died in the service. The whole forms a very peaceful picture, though the subject is grim and warlike.

A few minutes more brings you to Point Tiburon, where you leave the boat and take the train, and presently you are speeding along the track of the San Francisco and North Pacific railway.

The road winds among the oak-dotted knolls where it can, and plunges through the very heart of the hills where it must, until it reaches the pretty town of San Rafael. Quite a long tunnel is necessary to let you out on its northern side, and then you glide along the edge of salt marshes, with here and there a turn behind low hills, till you reach Petaluma. Some of the land which you have just passed is as rich as any in the State, as the sleek herds of cattle and heavily laden orchards plainly testify.

And now you enter the broad Sonoma valley, where level and productive fields spread out for miles on either side; you pause a moment at the county seat, Santa Rosa, a thriving city in the

midst of fertile plains, hasten past smaller towns, cross the Russian river below Healdsburg, where it turns away to the west to seek the coast among forests of redwood, and following its western bank you come to the town of Cloverdale. You are now near the head of the valley; the green slopes of the mountains are close upon you on the west and broken hills rise to the east. You have already passed in the distance the noble Saint Helena and many lesser peaks belonging to this eastern range of mountains, but here the valley has become so narrow that you are not surprised to learn that for many years this was the terminus of the railroad. Within a year, however, it has been extended some thirty miles further to Ukiah, the county seat of Mendocino county. Should you continue your excursion to that point, you would be amply repaid, for the road winds along the bank of the river in a most romantic fashion. Now you can look down into the clear water and see startled trout, now you pass under the boughs of giant oaks, again you are in the darkness of a tunnel, and in a moment look back on a huge cliff, whose base the river has been assaulting for centuries. The valley broadens at length, and the rich fields are green with hop-vines or covered with ripened grain or set with young fruit trees. A few miles beyond the city of Ukiah the hills close in again, and you are at the source of the Russian river, while just across the divide are the brooks which flow northward and form some of the numerous branches of the Eel river, which empties into the ocean near Eureka. But this part of the journey, though interesting, is not essential to a visit to the Geysers. The stage for the springs leaves Cloverdale soon after noon, and makes the journey of eighteen miles in from three to four hours. You first cross the Russian river, and as you proceed to the hills you soon meet and ford one of its tributaries, the sulphur-tinctured Pluton. This stream comes down a great lateral valley from the eastern hills, and along the side of this valley, first on the north and then on the south, has been constructed the stage toll-road. It would be hard to find a wilder and more beautiful road in any of the valleys of California. The curves are innumerable, the precipitous descents which it barely but safely avoids are sufficient to stir the blood of the boldest, while the grand old trees, oak, maple, and laurel, are majestic and inspiring. Especially as one is coming down the valley in the cool of the morning does the view seem superb. Were there no wonders beyond to be seen, the ride up and down the Pluton gorge is well worth the moderate price which is asked. But at length you smell sulphur, and know you are near the end of your journey. The hotel is before you, a series of low but comfortable buildings in the midst of fine old trees, and on the other side of the brook you get a glimpse of columns of steam ascending from unknown sources. You are anxious to explore at once, but are advised to wait till the early morning; meanwhile you can visit the commodious

bath-house, and refresh yourself with a bath of steam, "hot from Tartarus," and a swim in a tank of lukewarm mineral water, heated in nature's own kettle.

The next morning you are up before the sun, and taking a basket of breakfast on your arm you set out to explore the mysterious canyon. At various intervals along your path are springs of cold or warm water, each one having its own peculiar taste according to the nature of the minerals which are held in solution. Sulphur compounds, soda and alum, with salts of iron and magnesium are the principal ingredients. From some of the springs the beverage is so hot that you must cool it before putting it to your lips, and in general you are satisfied to sample the water rather gingerly. The product of one spring is called "hot lemonade," and it flows forth in a copious stream from the subterranean mixing bowl. You acknowledge the "hot," but are inclined after a trial to discredit the appropriateness of the latter name. You prefer the somewhat more technical term "An acidulated solution of the double sulphate of aluminium and potassium." However some people like to drink it. Hot springs and steaming banks abound over quite a large region, but the largest and most violent manifestations are found in the bed of a side canyon, which comes down from the north to Pluton river. It is a deep, V shaped gorge almost devoid of vegetation, and its steep walls are covered with masses of mineral matter, mostly of brownish yellow color, though varying in hue from white to jet black. Along the bottom tumbles a stream of hot water, which receives accessions from each new spring. Various small hot springs attract your attention as you enter the canyon, but your interest centers in the "Witches' Cauldron," about half way up the gulch. This is a basin some twenty feet square, partly filled with rocks and showing different degrees of activity on two of its sides. Next to the path, it is moderately quiet, but near the bank it is in most violent commotion. A huge column of steam continually ascends from its surface somewhat obscuring the view, but as the wind shifts it a little, you get a view of the water, jumping, boiling, foaming, dashing, while from a cleft in the rocks at brief intervals spurts out a fountain of hot spray, which falls into and is mixed with the seething water below. The vastness and violence of the chemical changes which are going on underneath are nowhere shown so clearly as at this point. The points of interest are numerous; one wishes to spend hours in examining these remarkable phenomena. Here is a kind of oven opening into the hill; you listen, and from within you hear the hoarse gurgle and groan of the imprisoned steam; here it comes whizzing out from beneath a rock, reminding you of the safety-valve of a locomotive; there on the bank is a gently steaming cleft, and around the outlet are the most delicate needle-shaped crystals of sulphur arranged like frost work on a cold pane. In the water of one spring is a black, inky mud; in another are layers of rich brown,

pink, and purple, while a bright green water moss seems to thrive in the warm flow, and forms another color in the mass of brilliant tints. Here are layers of delicate, snowy crystals of Epsom salts, there are coatings of green copperas, and all about you are suggestions for a wondrously beautiful and harmonious carpet.

Farther up the hill you find cool, shady trees, where you are glad to stop and rest, and then if you are disposed you can climb the mountains and look off upon the blue waters of Clear lake. On your return to Cloverdale, you pass several bands of campers, who have pitched their tents near the river, and you commend their wisdom in selecting so romantic and attractive a spot. Deer are on the hills, trout in the streams, cool waters and shady streams abound, and the peace of nature is over all.

From a scientific point of view the California Geysers are of great interest. To some they suggest the heated condition of the interior of the earth, but the irresistible conclusion which comes to the mind of one who studies all the phenomena is that the heat is caused by the decomposition of immense quantities of sulphurets contained in the surrounding and underlying rocks, and that the various minerals with which the waters are charged are the results of the varied and extensive chemical changes which are constantly taking place.

Josiah Keep.

A NEW SPECIES OF ERIOGONUM (E. FASTIGIATUM) FROM LOWER CALIFORNIA.

Eriogoneae, so prevalent on the Pacific Slope of North America as to give a peculiar feature to the vegetation of certain districts, diminish rapidly south of 32° N. Lat., being comparatively scantily represented in the northern tier of Mexican States and disappearing entirely within the tropics. Being specially adapted in their vegetative characters to a climate of winter rains and summer droughts, their southern extension is most prolonged along the line of the California coast range into the peninsula of Lower California. Here the peculiar conditions of growth bring to view a variety of interesting forms, many of which have been made known from recent explorations. Having been supplied with very complete material by Mr. C. R. Orcutt, the following addition to the list is herewith submitted.

ERIOGONUM FASTIGIATUM N. SP.

Fruticose 3-6 inches high, fastigiately branched from near the base and *dichotomous* above, younger stems densely *lanose*; leaves crowded below, more scattered above, linear lanceolate 3-5 mm in length, loosely hairy above, densely tomentose beneath strongly revolute, tapering below into a slender petiole with a broad membranous clasping base; involucre sessile in the upper axils, or terminal on the dichotomous branches, 2 mm in height, deeply five parted with acuminate segments, united below into

a membranous tube; perianth with broadly oval segments nearly equal, with short turbinate tube; bracteoles linear-hispid shorter than the pedicels; stamens nine, anthers redish, akenes narrowly winged, embryo not seen.

A low, densely branched shrub, its slender fastigiata branches forming a flattened summit, with the remains of dead foliage below, flowers rather conspicuous, intermixed with the projecting dichotomous branches. To be placed in the *virgatae* section though the inflorescence is mainly reduced to a single terminal involucre. Is apparently near to *E. taxifolium*, Greene, *Pi Honia* I. 267. C. R. Orcutt, No. 1501 La Salada, Lower California, April, 1886. C. C. Parry.

*CONTRIBUTIONS TOWARDS A LIST OF THE
FAUNA AND FLORA OF WET MOUNT-
AIN VALLEY, COLORADO. I.*

(Compiled for the Colorado Biological Association.)

In studying the problems of geographical distribution, it is especially necessary to consider the fauna and flora of any given region as a whole in order to come to sound and permanent conclusions. The forms of organic life are so intimately related, one with another, and have so important an influence in determining each others distribution and development, that a mere examination of any single group with a view to ascertaining the why and wherefore of its geographical range, is certain to present us with many apparent anomalies, which would readily be cleared up could we but know the distribution of other different but in this connection influential groups. The distribution and abundance of lepidoptera for instance, is most plainly influenced by the distribution of the plants on which the larvæ feed, and these plants are again influenced by the presence or absence of fertilizing insects and by parasitic fungi, by the browsing of animals and in endless different ways other than those of soil and climate. It is supposed that the fertilization of *Yucca* is dependent on a little moth *Pronuba*. Now a fine species of butterfly, *Megathymus yuccæ*, feeds in the larval stage upon the *Yucca*. Suppose that all the *Pronubas* were by some means exterminated, this would effect the *Yuccas* and so the *Megathymus*, as well as the *Yucca Aphis*, and many other insects—so that we may say that the distribution of *Megathymus* is actually dependent of that of *Pronuba*. And the same sort of thing can be demonstrated in endless different ways throughout organic nature.

The present series of lists will be prepared with these facts in view and it is hoped that they will form a basis for just conclusions respecting the origin and nature of the fauna and flora of this region. Though necessarily at present incomplete, they will at least offer fuller details than have been published hitherto respecting any one region in the Rocky Mountains, while every effort

will be made to add to and complete them in the course of time. The identifications have nearly all been made by able specialists and are hence as reliable as can be expected in the present somewhat chaotic state of systematic biology.

The district under consideration is about thirty miles in length and fifteen miles across at its broadest part. To the east it is bordered by the Wet Mountains and to the west by the Sangre de Cristo Range. The altitude is about 8,000 feet lower to the north and rising to over 13,000 feet on the peaks of the Sangre de Cristo. The northern portion of the valley is in Fremont county, the main portion being however in Custer county. The present papers will deal only with the Custer county portion of Wet Mountain valley (which embraces the whole of the valley proper, the northern part being really different in character) and only with altitudes below 10,000 feet, the higher altitudes properly deserving separate consideration. A full account of the topography, geology and climate of the valley may be prepared later.

LEPIDOPTERA HETEROCERA.

For identification in this group we are indebted to Messrs. Hy. Edwards, H. Strecker, Rev. G. D. Hulst and Lord Walsingham, while some *Rosita* records have been contributed by Mr. H. W. Nash. Many species not yet clearly identified are for the present omitted.

1. *Deilephila lineata*, Fab., abundant up to 8,300 feet.

2. *Smerinthus cerisii* var. *astarte*, Streck., one at light, by Swift Creek. Larvæ without reasonable doubt belonging to this species, occur on *Populus tremuloides*. *S. astarte*, larva; forty-seven mill. long, apple green. Head dull, pale green, with a rather broad yellow stripe on each side of face, these stripes converging above, to the slightly bifid crown. Body vivid yellowish-green, tapering anteriorly, with numerous pale yellow points scattered somewhat thickly over its surface. In the subdorsal region these points are somewhat larger and are arranged so as to form a distinct but narrow subdorsal pale band, reaching from the second to the tenth segment. Obliquely placed above each abdominal spiracle (except the last) is a somewhat narrow, pale yellow band, the first of these bands being almost obsolete and the last widened and elongated, reaching up to the anal horn, which is about three mill. long and straight, blue at the base above, otherwise purplish inclining to pink, with a black tip. Prolegs pink, claspers green; near Short Creek, September 5, 1888.

Pupa, thirty-one mill. long, very dark brown, shiny, somewhat rugose. It is possible that this species also feeds on willow, as an empty egg-shell of a *Smerinthus* was found on a willow leaf at West Cliff.

3. *Hepialus pulcher*, grote., near Willow Creek.

4. *Gnophaela vermiculata*, gr. and Rob., abundant near Swift Creek. When freshly emerged, the normally white parts

of the wings are tinged with a delicate primrose yellow. The white parts of the body are not so tinged. The yellow color is probably due to the fluid within the wing-membranes.

5. *Euprepia parthenos*; occurs at 8,400 feet altitude.
6. *Arctia blakei*, grote., one specimen August 10, 1887.
7. *Arctia pallida*, Strecker, frequent at 8,400 feet near Short Creek.
8. *Leptarctia lena*, Bdv., not rare on open ground.
9. *Alypia lorquini*, Rosita, (H. W. Nash.)
10. *Clisiocampa californica*, Pack., abundant near West Cliff, larvæ on *Ribes aureum*, Pursh and willow. Rosita, (Nash.)
11. *Samia gloveri*, Strecker, near Ula, (T. D. A. C.) Rosita, (Nash.)
12. *Halisidota maculata*, Harris, near Swift Creek.
13. *Antaploga dimidiata*, grote, near Swift Creek.
14. *Sesia*, n. sp. This has been turned over to Mr Hy. Edwards for description
15. *Agrotis clandestina*, Harris, near Swift Creek.
16. *Agrotis saucia*, Hb., not rare.
17. *Agrotis auxiliaris*, grote, very abundant in houses, etc.
18. *Agrotis auxiliaris* var. *introferens*, grote, with the type.
19. *Ufeus satyricus*, grote, abundant in houses during the colder months.
20. *Calocampa cineritia*, grote, not uncommon in the spring.
21. *Plusia brassicæ*, Riley, not rare, larva on cabbage.
22. *Heliothis armigera*, Hubn, frequent.
23. *Heliothis armigera*, var. *umbrosa*, grote, more rare.
24. *Caradrina civica*, grote, West Cliff.
25. *Anthœcia tumida*, grote near Swift Creek.
26. *Drasteria erectea*, Cramer. not rare.
27. *Metrocampa margaritata* var. *perlata*, guen., not rare. This is considered to be quite the same as the European *margaritata* by Mr. I. W. Tutt, to whom I sent an example so the name *perlata* will probably have to be entirely dropped.
28. *Tetracis angulifera*, one specimen, named by Mr. H. Edwards.
29. *Aplodes junctolinearia*, graef, near Swift Creek.
30. *Cidaria populata*, L., near Swift Creek, rather common.
31. *Larentia cœsiata*, L., near short Creek, one, expanse thirty-five and one half mill.
32. *Cabera variolaria*, guen., near Swift Creek.
33. *Cabera erythemaria*, guen., near Swift Creek.
34. *Eupithecia miserulata*, grote, one specimen.
35. *Bleptina caradrinalis*, guen., var. not common.
36. *Homopyralis ducalis*, one specimen.
37. *Botys inæqualis*, guen., near Swift Creek.
38. *Botys plumbofascialis*, Short Creek, named by Rev. G. D. Hulst.
39. *Eurycreon cereralis*, Zell., extremely abundant

40. *Eurycreon chortalis* grote, not so common.
41. *Crambus luteolellus* var. *ulœ*. Ckll; the type of *C. ulœ* was sent to Prof. Fernald, who referred it to *luteolellus*. I have not had access to the description of *C. luteolellus*, but Prof. Fernald gives *duplicatus*, *grote* and *zeellus*, Fernald, as synonyms also, and so far as one can tell from the entirely insufficient descriptions published of these they differ from *C. ulœ*. I have therefore compromised matters by quoting *ulœ* as a variety.
42. *Crambus sericinellus*, Zeller, near Swift Creek.
43. *Alucita hexadactyla*, L., very common.
44. *Lophoderus persicana*, near Short Creek.
45. *Carpocapsa pomonella*, L., larva in an imported apple at West Cliff.
46. *Psecadia semilugens*, Zell., common.
47. *Psecadia dicostrigella* var. *subcœrulea*, Walsm, near Short Creek.
48. *Laverna definitella*, Zell., near Swift Creek.

II—DIPTERA.

The following list is, of course, the merest fraction of what is to be found, but the difficulty of naming Diptera has hindered the preparation of any list worthy of the name. We hope to take the matter up to better purpose sometime in the future. For identifications of Diptera we are indebted to Prof. C. V. Riley and Mr. L. O. Howard.

1. *Cecidomyia salicis-strobiloides*, O. S., galls abundant on willow at West Cliff, many Hymenoptera as well as cecids reared from them.
2. *Cecidomyia bigeloviæ*, n. sp., a small species, about four mill. expanse, reared from wooly Trypetid galls on *Bigelovia*. Probably undescribed, but description deferred until further comparisons with described species have been made.
3. *Lucilia cæsar*, L., not very common.
4. *Musca domestica*, L., very abundant.
5. *Scriptotricha culta*, common, breeds in flower-heads of thistles.
6. *Melanostoma cœrulescens*, Williston, near Swift Creek.
7. *Eristalis hirtus*, Loew, near Swift creek.
8. *Microdon globosus*, a fly, presumed to be this, bred from pupa found in nest of *Formica integra*, nyl., at West Cliff.
9. *Dejeania vexatrix*, O. S., one specimen.
10. *Gonia frontosa* var. *ater*, Ckll., thorax and abdomen almost entirely black; near Swift Creek.
11. *Gonia exul*. Williston, West Cliff.

T. D. A. Cockerell.

ANALYSIS OF WATER FROM BUCKMAN'S SPRINGS.

In 1879 the editor of the *SCIENTIST* first visited the canyon where are found the delightful mineral springs, well known in San Diego county as Buckman's soda springs, situated some ten miles north of Campo and fifty miles east of San Diego.

During a two weeks pleasure trip in July we again visited this resort and were favored by our friend, the proprietor, with the following analysis of the water from one of the many springs, which analysis was made by Mr. George E. Colby at the University of California, and was endorsed as correct by E. W. Hilgard.

"The water is only very slightly turbid and tastes strongly pungent from the presence of free carbonic acid gas, of which it contains 418.2 cu. in. per gallon, keeping in solution the substances marked with an asterisk (*).

"On evaporation the water yields a solid residue at the rate of 119.33 grains per gallon; of this amount 11.80 grains is chemically combined water, with a very small quantity of organic matter, which is driven off by ignition, leaving 107.53 grains of strictly mineral matter, of which 62.38 grains was again soluble in water, 45.15 grains being insoluble.

"The composition of the residue is as follows:—

	Grains per Gallon
*Silica	7.17
Potassium chloride ..	3.52
Sodium chloride....	51.43
Calcium sulphate.....	8.26
*Calcium carbonate.....	31.65
*Magnesium carbonate ..	4.63
*Carbonate of iron87
Chemically combined water and organic matter	11.80
	<hr/>
Total.....	119.33

(Signed) GEO. E. COLBY."

Physicians unhesitatingly recommend the use of this water, and it has often proved very beneficial in cases arising from impure blood and debility. As a pleasure and health resort these springs are destined to become widely and favorably known.

TO WORKING ENTOMOLOGISTS.

Mosquitoes and house flies are perhaps the most numerous, widely distributed and persistent of the creatures that attack the health and comfort of human beings. Of their attacks upon our comfort every one is aware. Scientific investigation favors the belief that tuberculosis and ophthalmia are carried from diseased persons to healthy ones by the house fly, and German experi-

menters have shown that serious blood maladies may be transmitted by the mosquito.

Certainly, therefore, any suggestion however remote, of a means of decreasing the numbers of or exterminating these pests should be followed with all possible skill and patience.

I have observed dragon flies gathering in scores around my camp in Minnesota to feed on the mosquitoes. I recently saw a dragon fly that had devoured over thirty house flies still voracious for more. Entomologists have observed the larvæ of the dragon fly swallowing undeveloped mosquitoes in large numbers.

Now may we not have in the active, voracious, harmless "mosquito-hawk," an agency for greatly diminishing the numbers of the smaller insects?

Professor Baird's success in producing millions of healthy fish in a few laboratory boxes and jars, the propagation of silkworms by scores of millions from eggs carried half around the world to Italy, the success of the plan for breeding foreign humble-bees in Australasia to fertilize the red clover,—these and many other similar facts seem to show that scientific methods have reached a stage where it is reasonable to hope that a plan may be devised whereby whole tribes of noxious insects may be exterminated by the artificial multiplication of their innoxious enemies.

For the purpose of drawing the attention of entomologists to the subject mentioned, I have placed in the hands of Morris K. Jesup, Esq., President of the American Museum of Natural History, New York city, \$200, to be paid by him in three prizes of \$150, \$30, and \$20, for the three best essays based on original observations and experiments on the destruction of mosquitoes and flies by other insects.

The following suggestions are made as to the direction in which the investigation should be carried and the essay formulated.

1. Observations and experiments upon various insects that destroy mosquitoes and house flies, stating the method of and capacity for destruction.
2. Observations and experiments to determine the best dragon flies to be artificially multiplied for the two above named objects—probably species of *Aeschna*, *Libellula*, or *Diplax*.
3. Give detailed statements of the habits and life history of the species chosen, based on original and careful experiments and observations.
4. Suggest a plan for breeding the insects in large numbers with a sketch of apparatus, and estimated cost of producing them per thousand.
5. Formulate a plan for using the insects in the larva, pupa, or perfect state for the destruction of mosquitoes and flies, (*a*) in houses, (*b*) in cities, (*c*) in neighborhoods.

In awarding the prizes clearness of statement obtained by accompanying sketches and new and purely scientific facts in the

life history of the Libellulidæ of which so little is known, will be duly considered.

All the essays received may be published wholly or in part at the discretion of the judges, and full credit will in all cases be given to each observer.

The essays should be forwarded by December 1, 1889, to Mr. J. H. Winser, at the American Museum of Natural History 77th street and 8th Avenue, New York to whom all communications should be addressed.

Robert H. Lamborn.

*THE HUMMING BIRDS OF THE PACIFIC COAST
NORTH OF CAPE ST. LUCAS.*

Your correspondent asks, among other questions, how many species of humming birds there are in California. Six species occur in and west of the Sierra Nevada mountains and their southern extensions besides which, one if not two stragglers have been captured in this district, and three or four Mexican species are likely to be found, occasionally at least, in the Colorado Desert, as they have already been taken in Southern Arizona. The single eastern species, *T. colubris*, has not been taken on the Pacific Coast. A single example of *T. floressii* (Loddiges) was taken near Oakland by Mr. W. E. Bryant.

The known distribution of the six species is as follows:

1. *TROCHILLUS ALEXANDRI*. Black-chinned humming bird. Pacific Coast region from California east to Utah and Arizona, and southward.

2. *TROCHILLUS COSTÆ*. Costæ humming bird. Southern California, Arizona and Western Mexico.

3. *T. ANNÆ*. Anna's humming bird. California, Southern Arizona and Mexico.

4. *T. RUFUS*. Rufous humming bird. Rocky Mountains to the Pacific, north to Sitka, south to Mexico.

5. *T. ALLENI*. Allens humming bird. Pacific Coast north to British Columbia, east to Southern Arizona.

6. *T. CALLIOPE*. Calliope humming bird. Mountains of the Pacific Slope from British Columbia, south to Lower California, and east to Montana, Nevada and New Mexico.

With the exception of *T. annæ*, all the above leave California in the fall or early winter and go southward. *T. costæ*, however, is the only one of them that I found as far south as La Paz in winter, at which time it is abundant in the cape region. Xantus' humming bird, a beautiful species so far collected only in the peninsula between La Paz and Cape St. Lucas, may yet be discovered in summer in the mountains of San Diego county. It is a mountain loving species, usually found near fresh water.

T. alexandri breeds, on this coast, from San Diego county, or farther south, to British Columbia; *T. costœ* from Cape St. Lucas to San Bernardino county, perhaps as far north as Santa Barbara.

T. annœ breeds mostly in the agricultural districts of California. I have found both sexes in Butte county in December, and occasionally in the foot hills of Central California in all months of winter. My most southern Lower California record for this species is Cerros Island. *T. rufus* is mostly a mountain and northern breeding species. It probably breeds in the coast range as far south as Santa Cruz and still farther south in the Sierra Nevadas. It is rather rare in the high Sierras in latitude 38° , in breeding time, but is then abundant in some localities about a degree of latitude farther north.

T. Alleni was named by Mr. Henshaw in honor of Mr. C. A. Allen of Nicasio, Marin county, in 1877. It much resembles *T. rufus* and was treated as such previous to 1887 and is with difficulty distinguished from it in the field. I collected both sexes of *T. alleni* at San Diego in the spring of 1884 soon after I noticed the arrival of *T. rufus*, the latter having been first seen on March 10, and about the same time I saw fresh specimens in the possession of Mr. Carl H. Danielson of San Diego. Mr. Skirm says it is a rare summer resident at Santa Cruz, and I do not know that it breeds south of that place.

According to Mr. F. Stephens a few individuals of *T. calliope* breed as far south as the pine region of the San Bernardino mountains. It is moderately common in the fir forest of Calaveras county in the breeding season and very common during this time in the high Sierras of Butte and Plumas counties. A few individuals migrate through the low parts of California, but it appears to breed only in the mountainous parts of this State and northward. From the foregoing it will be seen that the nest found near Pasadena was probably the nest of *T. alexandri*, *T. costœ* or *T. annœ*, but without the parent positive identification is impossible. A nest and eggs without its owner may be a thing of beauty but usually it has no scientific value.

August 1, 1889.

L. Belding.

NOTES AND COMMENTS ON THE DISTRIBUTION
OF *PLANORBIS (HELISOMA) BICARINATUS*. SAY.

This well-known pond-snail first detected on the west coast of North America at Portland, Oregon, by Mr. Henry Hemphill, must also be credited to another west coast locality, namely to the region about the mouth of the Yaqui river near Guaymas, on the easterly side of the Gulf of California, about fourteen hundred miles south of the first named place where it was collected a few

years ago by Dr. Edward Palmer (U. S. Nat. Mus. 53,677). The National Museum series of this species is an interesting exhibit of the geographical distribution of this, for a *Planorbis*, well-marked form, as may be seen by the following:

Without making a list of the several States, Territories or localities represented by and included in the museum series and attested by numerous specimens, a simple geographical outline will be indicated by the exterior points herein named. Commencing at Cape Elizabeth, Maine, thence westerly, through Lake Simcoe Canada, thence to Manitoba¹ and Winnipeg² lakes, still westerly to Portland,³ Oregon; thence southerly to the Yaqui river near Guaymas, Mexico, thence easterly through Kansas, Alabama and Georgia, nearly to the Atlantic sea-board by the way of Virginia, the District of Columbia, Pennsylvania, New York and Massachusetts to the point first mentioned, Maine!

Its occurrence at a point so far to the west as Portland, Oregon, where Hemphill found it and the extreme southwesterly point on the easterly shore of the Gulf of California (Yaqui river), the Palmer locality, may be regarded as phenomenal. It will now be in order for parties who are inclined to make species, apparently upon no other ground than the fact of the remoteness of specimens in hand from the source or habitat of specimens already named or as species already described, to halt a little and lend a hand to the more useful and higher work of seeking by further researches and the accumulation of further geographical data to solve the interesting and fundamental problems included in the general term, *the distribution of species*. It would be well to observe the substantial hints offered by the Hemphill and Palmer locality to collectors to diligently seek whenever opportunity occurs for other localities within the territory indicated by these extreme outposts of its specific area. In the central region the National Museum contains specimens from Ft. Stevenson, Dakota and the Yellowstone Park. Its distribution to the eastward of these is pretty general and reasonably well known, but between these interior localities and the west coast, a glance at the map will more clearly impress the reader, as it will give a definite idea of the vast extent, of the enormous area that offers an ample reward to the field worker not only as to this species, but who can say as to how many others.

Not many years ago without doubt, these west coast specimens would have been honored with a specific title, for the matter of distribution was seldom considered. The great high-way furnished by the Colorado of the West, the extensive drainage system of which said river is the main channel includes no doubt within its northerly limits the source or sources from which the colony detected by Dr. Palmer, the first settlers we may call them migrated. Not one by one grand leap or by a single and direct

1—Collected by Miller Christy; 2—teste Bell; 3—H. Hemphill.

movement, but step by step, gaining one year and losing the next, but gradually through centuries extending the area of its territory until this extreme southerly and westerly outpost was reached. The same force which in its torrential fury carved the great cañons in the past, at times in milder moods, assisted by its distributing current to the extension of the territory of an insignificant form of animal life. So too with the colony found by Hemphill at Portland, Oregon. Follow the course of the Columbia on the map, trace its meanderings and note the remoter confluents that combine to make the greater stream and the extent of the drainage system and the area drained thereby. The same suggestion to the student of geographical distribution presents itself and affords a reasonable clue by means of which similar phenomena are explainable.

Robert E. C. Stearns.

U. S. National Museum. }
Washington, July 29, 1889. }

BRIEFER ARTICLES.

(From Demorest's Monthly Magazine.)

A MOVING LAKE OF ICE.—The Muir glacier, so named after Professor John Muir, the noted geologist who has described it most satisfactorily, is the most wonderful of the glaciers in southeastern Alaska. It is forty miles long, and is moving at the rate of sixty feet a day through the basin of the mountains. The greater portion of this crystal river, about an eighth of a mile wide, is billowed into rounded hills and beetling precipices, quite resembling the sea in a storm; and at the centre it is splintered into turrets and pinnacles of amethyst, turquoise and sapphire tinted ice with spires of dead-white crystal. All its surface is riven by countless crevasses, in the bottom of which streams of clear water find their way. These chasms are frightful gaps to anyone looking down between their walls. From this moving lake of ice, bearing rocks and long lines of detritus on its surface, vast masses break away as it emerges from a narrow gateway of mountains into the open bay. These icebergs fall off from the huge glacier and dash into the waters, making navigation perilous to craft of all kinds, even when miles away. Among the detritus frozen amid the ice masses, are veins of porphyry, jasper, chalcedony, and quartz; and blocks of finest marble, granite, and basalt are strewn upon the surface of the icebergs and the frozen lake in which they find their source. The traveler or explorer amid Arctic snows finds something appalling in the frozen wonders of our contradictory planet.

THE SORGHUM INDUSTRY.—The results of ten years of experiment and investigation by the Agricultural Department at Washington on the cultivation and manufacture of sorghum and

its products, do not appear to encourage the prosecution of the industry as an independent branch of business. According to recently published reports on the subject, it has been ascertained that the cultivation of the plant for sugar and syrup does not pay. The cost of machinery and the difficulty of obtaining that which is especially suited for the purpose, the high cost of skilled labor required for the success of all departments of the work, and the difficulty of finding a market for the necessarily crude product, are likely to prove obstacles that the ordinary farmer will not readily overcome. Kansas, which is one of the leading States in sorghum raising, reports for last year a yield of about ten tons per acre, for which growers received ten dollars per ton delivered at the factories. This gives but a small margin of profits; indeed, none at all, if labor must be hired. Experts are, however, of the opinion that there is a future for sorghum, and that with new and improved machinery its culture may be made profitable.

DESICCATION OF THE DEAD.—A unique plan for the disposition of the dead, with reference to the preservation of evidence in capital criminal cases, was recently laid before the Medico-Legal Convention. This system consists of a scientific process of desiccation by which the tissues are deprived of moisture and kept in a state of complete preservation, and in a condition which renders a critical examination and a chemical analysis of them at any time a simple and easy matter. The bodies are to be laid away in sepulchers arranged in tiers and rows in a great mausoleum, with more or less privacy, according to cost, each body to be perfectly accessible at all times. The sepulchers will each have one opening for admitting the body. In this there will be a plate-glass door, and, outside, a marble or metal door for safety. When the outer door is open the body may be seen, without discoloration or decay, but of course exceedingly emaciated. The preservation of the body is affected by means of a current of dry air passing through conduits formed in the concrete of which the sepulchers are composed, which bring the dry air into the sepulcher at one end, while at the other the air-current passes out laden with gases and moistures of the body which are carried to a furnace and consumed, so that no deleterious gases or offensive odors can escape to the outer air. A moderate current of such dry air accomplishes the desired purpose in about ninety days. After the work is finished, the conduits are hermetically closed; oxidization and decomposition are prevented, and the body remains in view through the glass door. This mode of disposing of the dead avoids all the unpleasant features of earth burial and its attendant unsanitary evils through poisoning the earth and water and storing disease germs to break out in future epidemics. The Mausoleum System, as the projectors call it, meets all the objections which cremationists urge against burial, and also meets the objections to cremation, by the preserva-

tion of the body, avoiding the shock to the sensibilities which revolt at the thought of the destruction by fire of the remains of loved ones. Other advantages of this new process are that it will prevent premature interments, and secure the body from theft.

THE CLIFF-DWELLERS.—The cliff or cave-dwellers, reported extinct by the Smithsonian Institution, have been discovered by thousands in Northern Mexico, by Lieutenant Schwatka, in charge of America's expedition into Mexico. In exploring the wild regions of the Sierra Madre Mountains, living cliff-dwellers were found in abundance, wild and timid, and flying at the white man's approach. Their habitations are precisely similar to the old, abandoned cliff-dwellings of Arizona and New Mexico, whose inhabitants were supposed by archæologists to antedate the mound-builders, and to be quite extinct. But Lieutenant Schwatka's discovery makes it clear that these are probably descendants of the ancient cliff-dwellers, who were driven from their more northern habitations, and retired to Southwestern Chihuahua, where they have been living for centuries, undisturbed, following the primitive habits and customs of their ancestors, about whom there has been so much speculation. Schwatka, therefore, gives to the world the first information relating to these curious people, and is about to set out on an expedition to follow up his discoveries and investigate them more thoroughly. He estimates that the cave and cliff-dwellers number from three to twelve thousand; and they are armed only with bows, arrows, and stone hatchets. They are tall, lean, and well-formed, with blackish-red skins, nearer the color of the negro than the American Indian. They are sun-worshippers, and practice several forms of devotion to that luminary.

ANOTHER MAMMOTH CAVE.—An exploring party attracted by the reports of a discovery made by a farmer in Wyandot County, Ohio, of a mysterious hole in Limestone Ridge, visited the place and made a descent to find out what was at the bottom of the story and the hole. The place proved to be an immense cavern, sixty feet in width at the landing the party made, they having gone down by rope 100 feet through a hole varying in diameter from three to thirty feet, through limestone rock. The ceiling rose like a dome to a height of at least fifty feet. Exploring the recesses of the cave, the party suddenly emerged into another mammoth chamber, apparently much larger than the first, and, like it, set with numerous stalactites and stalagmites of beautiful formation and marble-like whiteness, sparkling brilliantly in the light of the Roman candles fired into space by the visitors. At a long distance from the entrance they came upon a lake of pure, crystal clear, cold water, of unfathomable depth.

TO BREAK UP THE SLAVE-TRADE.—About \$4,150,000 have

been subscribed to build a railroad in Africa, between the lower falls of the Congo river and Stanley pool. The project of building this road, which will cover the distance of 262 miles, was formed by the King of the Belgians, whose interest in African exploration and in the abolition of the slave-trade in Africa is known throughout the world. He found a warm ally in Mr. McKinnon, the great Scotch ship-owner, an immensely wealthy man—said to be the largest individual ship-owner in the world—and another in Mr. Collis P. Huntington. This scheme is said to be actuated more by sentiment than by motives of gain, for the projectors believe that only by such means as opening up the Congo to travel can the fearful traffic in slaves be obliterated.

UNCERTAINTY OF "ELECTROCUTION."—The prophetic utterance of Professor Brackett, of Princeton College, in his address to the Electrical Club of New York last fall: "Notwithstanding the fact that in New York it is the law that all persons convicted of offenses that are punishable by death are hereafter to be executed by electricity, my belief is that never a single man will die, except by accident, by that method," seems likely to be verified. All the electricians of New York are asking to have the new execution law declared unconstitutional. The legality of the sentence passed upon the murderer William Kemmler, who was to have been the first executed by electricity, has been disputed on the ground that the punishment is cruel. Evidence will be taken before a referee, and persons interested in electricity are now eagerly awaiting the result of the case and the evidence taken.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

(San Francisco Microscopical Society, July 10, 1889.)

The semi-monthly meeting of the San Francisco Microscopical Society was held at its rooms 120 Sutter street, last evening. Vice-President Breckenfeld presided and spoke very feelingly of the death of F. L. Howard, one of the old time members, and offered the following resolutions, which were unanimously adopted:

WHEREAS, Our late esteemed friend and fellow-member, F. L. Howard, has been called from earth by the final summons, and we who have been associated with him in the San Francisco Microscopical Society are desirous of placing on record some fitting expression of the high regard in which we held him and of the sorrow we feel at his loss; be it

Resolved, That in the death of Mr. Howard this society is called upon to mourn the loss of one who, for many years, has been untiring in his devotion to its work and his interest in its welfare,

and who endeared himself to its members by his quiet enthusiasm in microscopical research and by his genial and kindly disposition.

Resolved, That these resolutions be spread upon the minutes of the society and a copy conveyed to his bereaved consort, with the assurance of our warmest sympathy and most sincere condolence.

C. P. Bates, Recording Secretary.

SANTA BARBARA SOCIETY OF NATURAL HISTORY.—July 26, 1889, Dr. L. G. Yates was elected corresponding secretary. Dr. Yates gave notice of the presentation for reading of papers on the ancient history of Mexico and Central America. Selections were read by several members on the discovery of *Rafflesia Schadenbergia* in the Philippine Islands; on the discovery of the nest and eggs of a rare bird, by Mr. Bryant in Lower California; on *Mastodon gigantea*, which Dr. Yates stated had been found more frequently in the foothills of the Sierra Nevadas in central California than in other localities; and on the edible fruit of the *Opuntia* (from the WEST AMERICAN SCIENTIST) followed by discussions. News from Mr. Clark Streator, now collecting in British Columbia for the American Museum of Natural History was reported;

Mrs E. Beckman, Secretary

BIBLIOGRAPHY.

THE STORY OF CREATION. A plain account of evolution by Edward Clodd. F. R. A. S. Illustrated. The Humboldt Publishing Co., 28 Lafayette Place, New York. Writing of this book a celebrated London critic says: "Surely the astounding history of the evolution of the visible universe has never been told more popularly perspicuously and pleasantly than in this volume," an opinion in which we entirely concur. Those of our readers who have neither the time nor the courage to read the more voluminous works on the subject of evolution will be much pleased with the concise and vigorous account given in this latest work by Mr. Clodd. There are over eighty illustrations, tables etc., and taken, all in all, we predict for it the largest sale of any book in a library already famous for its excellent list of subjects and low prices. It is No. 110 of the Humboldt Library, Price, 30 cents.

THE PLEASURES OF LIFE. Part 2. By Sir John Lubbock, Bart. This is No. 111 of the Humboldt Library, No. 97 of the same Library being Part 1. The author divides his subject into thirteen sections of which the titles are: Ambition, Wealth, Health, Love, Art, Poetry, Music, The Beauties of Nature, The Troubles of Life, Labor and Rest, Religion, The Hope of Progress and The Destiny of Man. Such of our readers as got the first number will be sure to get the second and those who did not should order both. Price, 15 cents each.

ORANGE CULTURE. Some facts relating to orange culture in Southern California, consisting of statements of experienced

orange growers obtained by personal interviews, has just been issued by Scipio Craig for the Redlands (Cal.) Orange Grove and Water Co. It is well worthy of a perusal at the hands of would-be-growers.

HISTORICAL SOCIETY OF SOUTHERN CALIFORNIA.—Annual publication of 1888-9. This issue is truly a historical pamphlet (fifty-five pages) containing no contributions to natural science, but of interest to the student of our State history, as it treats of some of the earlier political movements.

JOHN HAMILTON. Catalogue of the Coleoptera common to North America, Northern Asia and Europe, with distribution and bibliography. (Philadelphia, 1889; reprinted from Trans. Amer. Ent. Soc.) This valuable catalogue, enumerating as many as 484 species of Coleoptera common to the northern regions of both hemispheres will be of great assistance to all students of geographical distribution.

The general conclusions to which the author is led by the abundant facts thus marshaled in orderly array are "that Europe and America were formerly as widely separated by water as they now are; that eastern and western North America were divided by water centrally (the north-eastern part probably submerged in whole or in part); that the area now occupied by Behring sea from Kamschakta to Alaska and far west of the Aleutian Islands was land and possessed a more temperate climate than at present." For he says "The large number of native species in common and the intimate relation between the Coleoptera of North-western America and North-eastern Asia is brought out very prominently, while on the other hand the paucity of native common species on both the Atlantic Coasts is as plainly presented." This view, although contrary to that of many authors, is not new and is supported by many facts in distribution other than those presented by the Coleoptera.

Among ferns we have *Pteris serrulata* common to North America and China—but on the other hand what is to be said of *Woodwardia radicans* occurring at San Diego, Cal., and in Madeira? Among fishes the remarkable resemblance between the sturgeon of Asia and America (of the genera *Scaphirhynchus* and *Polyodon*) has been pointed out; of Phœnogamic plants, *Fragaria vesca*, although common to North America and Europe is found also in Japan, while W. O. Focke states that South Chinese and North Indian types of the genus *Rubus* occur in Mexico and Peru. These are only a few instances—many others of like nature might be given. Indeed, in an article on *Cervulus chudofski*, the Asiatic representative of our wapiti, printed in "Nature" in 1881 we read that "Taken in connection with other similar phenomena which have lately come to light, it tends to show very evidently that north America owes its many resemblances to the Palearctic fauna, not to any former land connection between Europe and North America, as was formerly supposed."

by the advocates of the fabulous "Atlantis," but to a bygone extension of land between East Asia and West America.

Taking Dr. Hamilton's catalogue more in detail, we notice the general resemblance of the list to the whole Coleopterous fauna of an oceanic island. The Staphylinidæ are remarkably numerous, and the Carabidæ very well represented, but the Curculionidæ and Chrysomelidæ are much less numerous than might have been expected. Additional localities might be given for many of the species, as for instance, the present writer has taken the following species in Colorado which are not recorded from that State in the catalogue; *Necrophorus vespilloides*, *Dermestes lardarius* var. *signatus*, *Meligethes brassicæ*, *Chalcophora virginien-sis*, *Eros aurora*, *Aphodius granarius*, *A. lividus* and *Hylotrupes bajulus*. It seems almost impossible that such species as *Aphodius granarius*, *A. lividus* and *Hylotrupes bajulus* can have been imported into America by human agency as suggested in the catalogue. Many species were supposed to have been imported by the older authors who imagined that quite identical forms did not occur naturally in both hemispheres, but the evidence of importation is often quite wanting. In certain cases the fact of a common eastern species not having yet crossed the great plains east of the Rockies, is strongly in favor of the view that its advent into America was a recent one (taken in conjunction with its occurrence in Europe), but in the present instances this is not the case.

T. D. A. C.

EDITORIAL.

From June to September the residents of Southern California almost unanimously decide that they "need a change of air," and all who can, spend from one to eight weeks away from their city or suburban homes, indulging themselves in the luxury of camping out in the woods. Some choose one locality, some another, but all seek more or less isolation though rarely with success. Such gay parties of old and young are usually equipped with a multitude of "necessities" which often prove more troublesome than useful. The editor formed one of these annual parties and can speak from a long experience of similar excursions, and we are tempted to parody some well-known lines after this fashion:

The woods were full of campers out,
And maidens red as deer,

Two lines is considered sufficient of this style of literature. The young lady was found so wicked as to repeat something like the following:

"Teachers to right of them,
Teachers to left of them,
Teachers in front of them,
Ordered and hungered," etc.,

but we don't care to remind her that we overheard these classic lines.

The daily paper recently noted a remarkable curiosity found in the vicinity of San Diego, which, it was announced, was to enrich the U. S. National Museum. It was nothing less interesting than a *red* bat, whose bite is reputed to be invariably fatal. A friend of the editor carefully examined this specimen, and gave us an accurate description, which we are pleased to furnish our readers in advance of any of our scientific contemporaries. (Diagnosis: a brick-bat.)

"Ere this reaches our readers we expect we shall have welcomed many prominent eastern scientists who have notified us of their intending visits to our coast. Dr. George Vasey, botanist of the Department of Agriculture, Major J. W. Powell, and others connected with the scientific work at Washington are among the number. We feel greatly encouraged at the present indications of an increase in interest and activity in scientific subjects in the west.

NOTES AND NEWS.

T. V. Munson of Denison, Texas, special agent of the U. S. Department of Agriculture and C. L. Hopkins assistant pomologist of the Department visited San Diego about August 1st, for the purpose of investigating the wild grapes and other native fruits and nuts of this section. The results will be published in a special report for free distribution by the Department.

Queen & Co., of Philadelphia have issued a new catalogue of their clearance sale of microscopes, objectives, etc.—A chance to obtain an outfit or accessories and sundries at low cost.

The cotton tree (*Rhus cotinoides*) is said to "kill other trees and to then commit suicide,"—hence the planting of this tree is not recommended.

Dr. C. C. Parry has returned to his home in Davenport, Iowa, much to the regret of his California friends.

A genuine midsummer number is *The Century* for August, with its opening article on "The Stream of Pleasure—the River Thames" by the Pennells,—husband and wife. Vacationists will find matter of interest in Dr. Weir Mitchell's profusely illustrated article on "The Poison of Serpents"—a line of inquiry in which he has made important discoveries. Remington, artist and writer, describes with pen and pencil his outing with the Cheyennes; and a group of well-known wood-engravers describe with drawings and engravings by each, a wood-engraver's camp on the Connecticut River, as well as the methods of the American school of wood-engraving.

Dr. Dight, who is Professor of Anatomy in the American College of Beirut, Syria, has made a careful comparison of a collect-

ion of human skulls which are stored away in an old monastery in the Kedron Valley midway between Jerusalem and the Dead Sea, with skulls of the same race at the present day. The measurements show some significant differences. The Caucasian skull has, during the past thirteen centuries, increased in circumference nearly two inches, and has gained in cranial capacity three and one-half inches. There has been no increase in width. The brain has gained in height and length—*i. e.*, there has been a development of the upper and anterior parts of the brain, the parts which we should expect to increase by education and civilization as they preside over the moral and intellectual functions. The lower portions of the brain, in which the lower or more selfish propensities are centered, and which give breadth to the head, have, in the march of the centuries, failed to grow as rapidly as the higher brain centers, hence the non-increase in the width of our skulls.

Professor Palmieri announces from the Vesuvian observatory that the eruptive cone of Vesuvius has fallen into its very depths, and that at the same time a copious stream of lava has issued from the north-east and has already arrived at the foot of the great cone. About the same time the volcanic mountain of Lipari made an extraordinary display. From the crater of the mountain smoke issued mixed with ashes, which was changed into very fine rain over the whole of the Æolian Islands. The air was thick and unbreathable; all the horizon was obscured by the blackest clouds and by ashes. The Grotto della Signora, to the west of Lipari, which has defied the ruin of centuries, is now destroyed. It appears that the volcano by its frequent shocks has completed the work of demolition.

According to the *Indian Mail*, the Madras Museum now possesses the skeleton of the largest elephant ever killed in India. This elephant was the source of great terror to the inhabitants of South Arcot, by whom it was killed and buried. The museum authorities dispatched a taxidermist to the spot to exhume the bones and transfer them to Madras. The skeleton is exactly ten feet six inches in height, being eight inches higher than the highest hitherto measured.

The Swedish government has decided to send a man-of-war to New York to take home the body of Captain Ericsson, who expressed a strong desire to be buried at Langbanshyttan, in Vermeland, the place of his birth. In his will no directions are given as to the disposal of his valuable collection of models, but Swedish journals state that the executors will present them to the Smithsonian Institution.

Dr. Eigenmann has succeeded in hatching fish eggs in thirteen hours—seven hours quicker than previous records.

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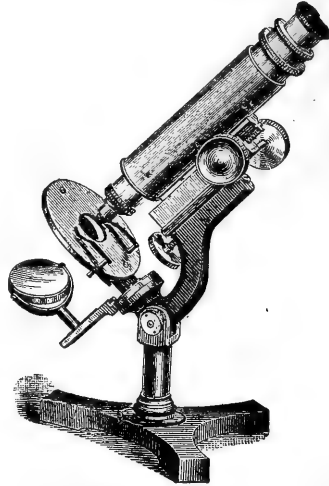
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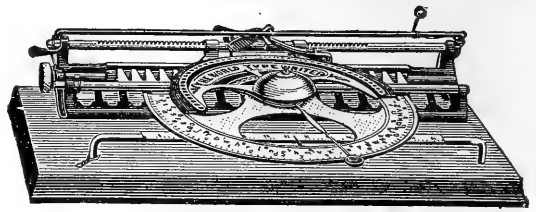
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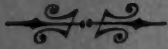
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