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C. R. ORCUTT, - - - EDITOR.

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# THE WEST AMERICAN SCIENTIST.

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## THE MEALY BUGS OF THE UNITED STATES.

The mealy bugs derive their name from the white, mealy powder with which their bodies are covered. They are furnished with six legs and two antennæ; the adult male is provided with a single pair of wings, but the female never acquires these organs. The following tables will aid in determining the different species known to occur in this country. *Adonidium longifilis*, and the male of *citri* are unknown to me, and their places in the following tables are assigned to them in accordance with the excellent descriptions of these species given by Prof. Comstock in the Report of the U. S. Dept. of Agriculture for the year 1880. The male of *Ryani* is at present unknown.

### FEMALES.

- 1.—Joint 6 of antennæ longer than 3; the two anal appendages as long as the entire body. . . . . *adonidium*, Linn.  
Joint 6 of antennæ shorter than 3. . . . . 2.
- 2.—Seventh antennal joint much shorter than the second. . 3.  
Seventh antennal joint as long as the second; anal appendages never one-half as long as the body; eggs deposited in a cottony mass. . . . . *citri*, Boisd.
- 3.—Anal appendages as long as the entire body  
. . . . . *longifilis*, Com.  
Anal appendages never as long as the body. . . . . 4.
- 4.—Body thickly covered with mealy matter, first antennal joint shorter than the fifth; young brought forth alive; no cottony egg-mass. . . . . *Crawii*, n. sp.  
Body nearly naked, first antennal joint longer than the fifth; eggs laid in a cottony mass. . . . . *Ryani*, n. sp.

### MALES.

- 1.—Joint 6 of antennæ shorter than 10. . . . . 2  
Joint 6 longer than 10. . . . . 3
- 2.—Antennal joint 8 longer than 7. . . . . *adonidium*, Linn.  
Antennal joint 7 as long as 8. . . . . *citri*, Boisd.
- 3.—Expanse of wings 7 mm. (over one-fourth of an inch)  
. . . . . *Crawii*, n. sp.  
Expanse of wings 2.6 mm. (about one-tenth of an inch)  
. . . . . *longifilis*, Com.

THE ORANGE MEALY-BUG (*Dactylopius citri*, Boisduval;  
Synonyms: *D. destructor*, Comstock, *Coccus phyllococcus*,

Ashmead). This species is sometimes very destructive to orange trees in the Southern States, and also in the south of Europe. It is the only described species known to me to occur on the Pacific Coast, where it also infests orange trees.

THE CYPRESS MEALY-BUG (*Dactylopius Ryani*, n. sp.). Adult female rounded-oval, or ellipsoidal, posterior end of abdomen convex; dull salmon-brown, legs and antennæ lighter; very sparsely covered with a white, mealy powder not concealing the ground color; white cottony appendages along sides of body very short; the two at the posterior end never more than one-third as long as the body; antennal joints 2, 3 and 8 sub-equal in length, longer than any of the others, the eighth twice as long as the seventh; joint 1 is next in length and is much thicker than either of the others; then 4, 5 and 7 sub-equal in length, joint 6 being the shortest, scarcely one-third as long as the eighth; tubercle of proboscis one-half as long as the tibia, situated slightly in advance of a line drawn between the front coxæ; tarsi one-third as long as tibiæ, no tooth on underside of the claw, upper and lower digitules knobbed at the tip; length of body nearly 3 mm. (about one-eighth of an inch).

Recently hatched female larva elongate-ellipsoidal, posterior end of abdomen truncated and bearing two quite long white cottony appendages between which is a pointed projection; body pale yellow, tip of proboscis-tubercle purplish; antennæ six-jointed, but the first four joints not well defined, the sixth about as long as the first three taken together.

Egg elongate-ellipsoidal, minutely granulated; pale yellow. The eggs are deposited in a mass of loose white cottony matter which is sometimes twice as long as the body of the female.

Named in honor of its discoverer, Mr. F. G. Ryan, of Anaheim, Cal., who reports finding it on Monterey cypress (*Cupressus macrocarpa*), Chinese arbor-vitæ (*Thuja orientalis*), and on Norfolk Island pine (*Araucaria excelsa*). Later I received specimens from Col. F. H. Keith, of the same place. This is the only species of mealy-bug known to me to infest Conifers.

THE SAGE MEALY-BUG (*Dactylopius Crawii*, n. sp.). Female elongate-ellipsoidal, posterior end of abdomen slightly concave; wholly light yellow; above thickly covered with a white, mealy powder, the margins furnished with about thirty-four white cottony appendages, the two at posterior end of body the longest, about equalling one-third length of body; antennal joints 2, 3 and 8 sub-equal in length and longer than any of the others, the eighth twice as long as the seventh; the fifth is next in length, then the fourth and seventh, the sixth and the first being the shortest, but the difference in length between them and the fourth and seventh is slight; tubercle of proboscis and the tarsi as in *Ryani*; length of body 4 mm. (about one-sixth of an inch).

The female brings forth her young alive, and simply secretes a layer of white cottony matter, on which she rests.



Male larva, fully grown, same as the adult female above described, except that the legs and antennæ (excepting apices of joints 3 to 7) are dark brown, and there is a large brown spot on the breast in front of a line drawn between the front coxæ, and a smaller brown spot behind a line drawn between the middle coxæ; antennal joints 3 and 8 the longest, each nearly twice as long as the second; joint 4 next in length, then 5, then 6 and 7 subequal, then 1 and 2 the shortest; tarsi one-half as long as the tibiæ the claws with a distinct tooth slightly beyond the middle; length of body  $3\frac{1}{4}$  mm.

The cocoon of the male is elongate-ellipsoidal, of a uniform close texture, and pure white; it measures 4 mm. long by  $1\frac{1}{4}$  mm. in diameter.

Adult male blackish-brown, abdomen lighter towards the tip, covered with a mealy substance; antennal joints 3 to 9 becoming successively shorter, the ninth being about four-fifths as long as the tenth, the latter much constricted at its first fourth; joint 1 nearly one-third as long as 10, joint 2 the shortest, being as wide as long; joints 1 and 2 more robust than the others; joints 3 to 9 much constricted at their tips, each with a large swelling at the base and with three or four smaller swellings, the apical one but slightly smaller than the one at the base, each bearing long bristles somewhat arranged in whorls; thorax three-fourths as long as the abdomen; wings smoky-gray; the two veins black except their bases, which are yellowish, and there is a dark brown fold on either side of each vein; poisers furnished at tip with four hooked bristles; tarsal claw much swollen below, the swelling bearing two short spines on its apex, and in front of these are the knobbed digitules; upperdigitules not knobbed; length of body 3 to  $3\frac{1}{2}$  mm., of anal appendages 7 mm., expanse of wings 7 mm.

I found this species in large numbers near Los Angeles, on the leaves of wild sage (*Audibertia polystachya*) as kindly determined for me by the editor, Mr. C. R. Orcutt, to whom I am indebted for many similar favors.

The males issued early in May from larvæ found on the 14th of March, the larvæ, as in the other species, secreting a white cottony cocoon in which to pass their transformations.

I take great pleasure in dedicating this fine species in honor of my friend, Mr. Alexander Craw, of this city, who has aided me much in my entomological studies.

*D. W. Coquillett.*

LOS ANGELES, CAL.

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## NOTES FROM THE SAN DIEGO BIOLOGICAL LABORATORY.

### THE FISHES OF CORTEZ BANKS.

By C. H. and R. S. Eigenmann.

During the winter of 1889 the U. S. Fish Commission Steamer Albatross conducted investigations about San Diego. Part of

the work consisted in exploring the Cortez Banks. The results of this exploration have not yet been published. The older charts show them to be situated about a hundred miles from San Diego. The shoalest water is on Bishop Rock, two and one-half fathoms. In some unaccountable way the rumor was spread that the Albatross had discovered a Cod Bank. This rumor was scarcely dispelled after Lieutenant Tanner's published enumeration of the food fishes of the Cortez Banks, and the statement that no cod-fish were found there. One of the outcomes of the rumors thus set afloat was the establishment of the Pacific Ocean Fish and Canning Company, whose immediate object is the exploration of the economic value of the Cortez Banks. Through the courtesy of Mr. D. Schuyler, I was enabled to accompany the company's schooner *Azalene* on one of her exploring trips. Although the expedition was highly satisfactory from an economic standpoint, the scientific results were more so. Twenty species have been added to the fauna of the San Diego region; eight species of these are new; eight have been known from the north only; several from north of Point Conception; three are from the south, and one from the open sea.

The following list of the species obtained may prove of interest: Those new to the locality are marked with an asterisk. Some of these have been noticed by us in the San Diego markets the past winter.

1. \**SQUALUS ACANTHIAS* L.—A school of this species was encountered in forty-five fathoms. About a dozen were captured. Some of them contained eggs nearly ready to be deposited. This species is at once recognized by its teeth and by its white spots.

2. \**CARCARHINUS GLAUCUS* (L.)—One specimen from forty-five fathoms.

3. *STOLEPHORUS DELICATISSIMUS* (Girard.)—One specimen from the stomach of an albacore near the banks; several others from verellas.

4. \**MYCTOPHUM CALIFORNIENSE* sp. nov.—Several specimens from forty-five fathoms. .095 m. This species is evidently very closely related to *M. boops* (Richardson), from Vancouver's Island. The chief point in which our specimens differ from the descriptions of *boops* is the length of the pectorals. The position of the adipose fin differs also from the figure in Günther's "Study of Fishes" and the tail is much slenderer.

D. 14; A. 21; lat. 1.42; depth 5; head  $3\frac{3}{4}$ .

Body compressed-elongate, deepest above the pectorals; dorsal and ventral outlines equally arched. Caudal peduncle long, slender, its depth about 3 in the greatest depth. Head short and deep, its depth about  $1\frac{1}{2}$  in its length. Eye very large, with over-arching supraorbitals and raised postorbitals; nasal ridge  $\frac{3}{4}$  the length of the eye. Eye 3 in head,  $\frac{3}{4}$  in interorbital. Preopercular margin but little oblique, opercle and sub-opercle

with a rounded margin. Maxillary considerably dilated behind, about  $1\frac{1}{2}$  to  $1\frac{2}{3}$  in head.

Scales entire.

Origin of dorsal fin much nearer tip of snout than to origin of caudal; base of dorsal  $2\frac{1}{2}$  in distance from base of middle caudal rays to last dorsal ray. Adipose fin equidistant from caudal and dorsal. Ventrals about reaching vent; pectorals not to second third of ventrals.

Phosphorescent spots placed as follows: One on each ramus of the mandible below the anterior margin of the eye; two on each side of the gill membrane, the first below the posterior margin of the pupil, the second below the end of the maxillary; one just behind the margin of the pre-opercle near the maxillary; another between the opercle and sub-opercle just behind the pre-opercle; five pairs on breast, four pairs between ventrals and anal; eleven pairs along the anal; four or five pairs along the caudal peduncle; two pairs on caudal peduncle behind the first accessory ray of the caudal; one just below the twenty-seventh scale of the lateral line, another just below the eighteenth scale; one midway between the latter and the last of the abdominal pairs; one about midway between the lateral line and second pair of the abdominal series, another similarly placed above the ventrals, one on lower margin of base of pectoral; one just above the second of the breast pairs, and another above this near the lateral line; the three last forming an isosceles triangle. Caudal peduncle superiorly with six large phosphorescent spots which in our specimens appear as white fatty spots. Black, the sides lighter, with numerous black dots. All the scales which are present and the head strongly coerulescent or steel blue. Pectoral smutty at base; dorsal, ventrals and anal white. Caudal white, with black cross lines.

5. \*MYCTOPHUM TOWNSENDI sp. nov. Several specimens, the longest .09 m. from forty-five fathoms. These specimens were collected with those of *M. californiense*.

D. 13-14; A. 14-15; lat. 1. about 35; depth  $4\frac{1}{2}$ -5; head  $3-3\frac{1}{2}$ .

Similar in form to *M. californiense*, the head longer, the caudal peduncle deeper, the eye infringing less on the profile. Depth of caudal peduncle little more than two in the greatest depth.

Head long, its depth about one and two-thirds in its length. Eye large, with broader supraorbitals than in *californiense*. Nasal ridge long and very high. Eye  $3\frac{1}{3}$  in head, interorbital somewhat wider than an orbital diameter, opercles as in *californiense*; maxillary not dilated behind,  $1\frac{1}{2}$  in head.

Origin of dorsal about equidistant from tip of snout and first caudal fulcrum; base of dorsal somewhat more than two in the distance from middle caudal rays to last dorsal ray. Highest dorsal ray about two in head. Ventrals reaching vent. Pectorals narrow, reaching origin of anal.

Several recurved spines on caudal peduncle above and below. Phosphorescent spots of the head as in *californiense*, the spots in

the ventral series fewer in number; five pairs on breast; four pairs between ventrals and anal; six pairs along base of anal; six pairs along caudal peduncle; two pairs on caudal peduncle above the spines. Spots of the sides as in *californiense* with an additional spot on base of middle caudal rays, and another between the last of the anal pairs and the one below the twenty-fourth(?) scale of the lateral line.

Ventral surface of the caudal peduncle white; a similar light area along the base of the anal fin and another on middle of belly. A V-shaped spot in front of the anal in one specimen.

Color chiefly black; cheeks, opercles and scales metallic blue; mandibles barred with light, base of caudal black, the rest of the caudal fin and the other vertical fins light with black lines; ventrals and anal light, spotted with black.

We dedicate this species to Mr. Charles H. Townsend, Naturalist of the U. S. Fish Commission Steamer Albatross.

NOTOSCOPELLUS or gen. nov.

Pectorals much smaller than the ventrals, placed low, their upper margin scarcely above the ventrals. Eye comparatively small; dorsal longer than the anal, the anterior rays elevated.

6. \* ? BRACHYCHIER sp. nov.—

Types three specimens from forty-five fathoms. .09 m.

D. 20-23; A. 18-20; depth  $4\frac{3}{4}$  head  $3\frac{1}{3}$ ; lat. l. about 40.

Elongate, compressed; dorsal and ventral outlines equally arched. Head long, slender, the snout pointed, the profile only moderately rounded. Preopercle extending very obliquely backward and downward, its margin parallel with that of the opercle. Sub-opercle extending back beyond base of pectoral. Mouth large, maxillary not dilated posteriorly, one and two-fifths in the head.

Eye four in head, about one in interorbital. Iris black.

Dorsal falcate, the highest ray one and two-fifths in head; highest anal ray two in head. Origin of dorsal equidistant from tip of snout and end of anal, end of dorsal equidistant from its origin and base of middle caudal rays. Ventrals not reaching to vent. Pectorals minute: not nearly reaching ventrals.

A large elongate white spot on the dorsal surface of the caudal peduncle. Chiefly black, fins dark with lighter bars; base of caudal black.

7 EXOCÆTUS CALIFORNICUS Cooper.—Several seen flying over the banks.

8. \*XIPHIAS GLADIUS L. Sword fish. One individual seen.

9. SCOMBER COLIAS Gmelin. Mackerel. Several schools seen between San Diego and the banks.

10. SCOMBEROMORUS MACULATUS (Mitchill.) Spanish Mackerel. Several seen.

11. SARDA CHILENSIS (Cuv. and Val.) Several schools seen.

12. \*ORCYNUS ALALONGA (Gmelin.) Albicore. Surface fish; a number captured.

13. *TRACHURUS PICTURATUS* (Bowdich.) Large specimens of this species were taken from the stomachs of *Sebastichthys miniatus*.

14. *SERIOLA DORSALIS* (Gill). Yellow tail. A number procured at one locality in fifteen fathoms.

15. *SERRANUS CLATHRATUS* (Girard.) On sandy bottom near San Clemente Island.

16. *STEREOLEPIS GIGAS* Ayres. Two individuals of about 300 pounds each, one at a depth of fifteen fathoms, the other of twenty-three fathoms. These fishes are always found in company with the "white fish" on which they feed.

17. *GIRELLA NIGRICANS* (Ayres.) Occasionally found in from fifteen to twenty-five fathoms.

18. \**DITREMA ORTHONOTUS* sp. nov.—A single specimen much digested. .18 m. to base of caudal; forty-five fathoms.

We judge this species to belong to the genus *Ditrema* from its single series of conical teeth and the size of the scales preserved above the anal fin. An absolute identification cannot be made from this specimen.

This species seems to differ in the straightness of its back from all others of the family known.

D. X, 22; A. III, 29; head 4; depth above origin of anal about three in the length.

Greatly compressed, dorsal outline almost straight from tip of snout to caudal; ventral outline greatly arched.

Mouth small, very oblique, on an angle of  $45^\circ$ ; maxillary not reaching front of orbit. Teeth  $\frac{6}{4}$ ; those of the upper jaw truly conical, those of the lower jaw truncate. Eye large, 3 in head, placed in the middle third; interorbital little convex. Gill rakers about 4 in the eye. Highest dorsal spine 2 in the head, the highest ray but little longer. Caudal deeply forked. Anal spines graduated, the third  $1\frac{1}{2}$  in eye. Ventrals? Pectorals reaching to near vent.

A large area above anal silvery; color elsewhere obliterated. This species is closely related to and may be identical with *D. atripes* J. and G. It differs from it especially in the slightly convex interorbital and the higher premaxillary.

19. *TROCHOCOPUS PULCHER* (Ayres.) Fat head.—This is one of the most abundant of the food fishes. It is always found in shallow water and on rocky bottom.

20. *PSEUDOJULIS MODESTUS* (Girard,) Señorita. Ranging from the surface to forty-five fathoms. Several from the stomachs of rock fish.

21. *CAULOLATILUS PRINCEPS* (Jenyns) White fish. Important food fish. This species goes in schools, though single individuals are occasionally caught. Some of the specimens with empty ovaries, others with ripe eggs.

22. \**SEBASTODES PAUCISPINIS* (Ayers.) This is one of the most abundant of the rock fishes, and on account of its large size is an important food fish. As is the case with the other

species of this family; the younger forms are found in shallower water. The largest were found in forty-five fathoms, the smaller in fifteen fathoms.

The old frequently have large black blotches irregularly placed. The lateral line is usually light, this light area being bordered by two series of dark spots. The sides are salmon colored, some individuals being profusely spotted with dark. The young are more uniform in color.

23. *SEBASTICHTHYS FLAVIDUS* Ayres. Found with the preceding species. This species does not attain a large size, the largest not weighing over two pounds. It resembles *Serranus clathratus*, the sand bass, in shape and color and can readily be distinguished from the other rock fishes by its yellowish fins. The sides are gray, darker above. A series of large, light blotches, along the back. These are sometimes quite white.

24. \**SEBASTICHTHYS MELANOPS* (Girard.) A small species not very abundant; in shallow water. Oval in shape; side slate-colored with darker markings; belly white. D. XIII,  $15\frac{1}{2}$ ; A. III,  $8\frac{1}{2}$  or  $9\frac{1}{2}$ . Jelly fish found in the stomach.

25. \**SEBASTICHTHYS OVALIS* (Ayres.) Abundant in deep water. (48 fathoms.) This is the deepest and thinnest of the rock cods. Sides and fins with many small black dots. The young of this species was frequently found in the stomachs of other more strongly armed species of this genus. Its color is quite different from that of the adult. A specimen .19 m. long, is yellowish gray, white below, darker above. A dark ashy spot on lateral line below sixth dorsal spine; another just below the lateral line below the tenth dorsal spine; a larger one above the lateral line below posterior part of soft dorsal; another on caudal peduncle just behind the dorsal. Dorsal fins colored like the dark spots, caudal like the body. Pectorals, ventrals and tip of anal pink; base of anal yellowish. Three dark lines radiating from eye. A dark line on maxillaries. A silvery spot on opercle. Iris pearl colored. D. XIII,  $14\frac{1}{2}$ ; A. III,  $7\frac{1}{2}$ .

26. *SEBASTICHTHYS MINIATUS* Jordan & Gilbert. The most abundant species. 35 to 50 fathoms. Feeds on other fishes, chiefly other species of *Sebastichthys*.

Back and upper parts of sides bright lemon yellow, with numerous dark spots, which, in the smaller individuals are united to form mottlings or vermiculations. Lateral line deep red; lower part of sides and belly light red; all the fins deep red, the color of the back sometimes encroaching on the dorsal fins. Sides of head deep red, three yellow lines radiating from eye. D. XIII,  $14\frac{1}{2}$ ; A. III,  $7\frac{1}{2}$ .

27. \**SEBASTICHTHYS RUBER* (Ayres.) Not very abundant. All the individuals caught were of a large size and found in deep water. One female with young—probably several million.

This species can best be distinguished by the rough ridges on the head. Rosy above becoming lemon yellow on belly; fins all dark brick-red, narrowly edged with black.

28. \*SEBASTICHTHYS LEVIS sp. nov. Type one specimen .67 m.

D. XIII,  $13\frac{1}{2}$ ; A. III,  $7\frac{1}{2}$ ; lat. 1. 50; head  $2\frac{3}{4}$ ; depth 3.

Head very large, pointed; its upper and lower outlines equally inclined. Mouth large, lower jaw projecting and entering the profile; a well developed symphyseal knob. Maxillary reaching to below posterior margin of pupil, greatly dilated behind, its width about equal to the diameter of the eye. Eye  $1\frac{3}{5}$  in snout,  $5\frac{1}{2}$  in head, 1 in interorbital which is very slightly convex.

Cranial ridges low and smooth, each one ending in a sharp spine. Preocular, supraocular, postocular, tympanic and occipital spines present. Occipital ridges diverging backward, longer than eye. Suborbital stay weak; opercular spines strong, pointed.

Gill rakers all short, about twice as high as wide. Scales of the head all cycloid, each scale with numerous small accessory scales. Mandible, maxillary and tip of snout naked, preorbital with scattered patches of scales; scales of the body weakly ctenoid.

Highest dorsal spine little less than half length of head, the membranes very deeply incised, those of the first three spines meeting the succeeding ones on their basal fifth, the incisions becoming gradually shallower backward, the tenth membrane meeting the eleventh spine on its upper third. Dorsal rays considerably lower than the highest spine. Caudal emarginate. Second anal spine greatly thickened,  $4\frac{1}{2}$  in head. Ventrals about two in the head. Pectorals  $1\frac{4}{5}$ . Peritoneum white.

Pink, with four interrupted cross bars of black, the first below origin of dorsal, second below sixth dorsal spine, third below tenth spine, fourth below seventh dorsal ray. Back sometimes dusky. One specimen has a large black blotch on anterior part of soft dorsal.

This is one of the largest of the rock cods. It was occasionally brought into the San Diego markets during the winter, but for lack of sufficient material for comparison we did not venture to publish a description at the time. It is moderately abundant in deep water and can always be readily distinguished by the color, the shape of the head and the deeply incised dorsal. Those caught would average about eight pounds each.

29. SEBASTICHTHYS CONSTELLATUS Jordan and Gilbert. Next to *miniatus* the most abundant species, averging much less in size; 25 to 50 fathoms. Orange colored, the back usually with olive green markings, sometimes colored like the sides. Sides and back with many white or pale blue dots. A rose colored spot under the fourth dorsal spine, another under the eighth dorsal spine; one under last dorsal spine, another under end of soft dorsal.

30. \*SEBASTICHTHYS ROSACEUS (Girard.) A small species not rare. 20 to 40 fathoms. Sides brightest orange red, interspersed below with white. Four lightspots on sides surrounded by purple. Back with many purple markings; sometimes the

orange, sometimes the purple predominates on the back and on head. All the fin rays purple, the membranes greenish yellow. Jaws purple.

31. \*SEBASTICSHYS CHLOROSTICTUS Jordan and Gilbert. Very abundant with *S. miniatus*, somewhat larger than *S. constellatus*. Upper parts of sides with many olive green spots.

32. \*SEBASTICHTHYS ELONGATUS (Ayes.) Rather rare; in deep water. White overlaid with rosy; sides with three irregular horizontal bands of olive green, the lower two united posteriorly.

33. \*SEBASTICHTHYS RUBROVINCTUS Jordan and Gilbert. Rare; two specimens from 35 fathoms. One of the brightest of the rock cods. Silvery tinged with rose color, sides with five bright scarlet cross bands.

34. SEBASTICHTHYS CARNATUS Jordan and Gilbert. Rather common in twenty fathoms. Large specimens of *Otophidium taylori* were found in the stomach which is not protruded as in the other species.

Back yellowish green, a flesh colored spot between second and third dorsal spines, extending upon the back but not meeting a band of similar color extending along the posterior part of lateral line. Sides flesh colored, sometimes with scattered scales of black. Interorbital colored like the back, the region between it and the dorsal fin flesh colored, a dusky line dividing this region into a narrower anterior and broader posterior part. Two dark bands extending back from eye, another below the eye from snout to opercle. Spines of the head not raised above the surrounding parts. D. XIII,  $12\frac{1}{2}$ ; A. III,  $6\frac{1}{2}$ .

About a dozen much darker individuals of this species were caught, all of them with one or another fin mutilated. They were at first supposed to be *S. chrysomelas*, but no specimens were preserved as it was hoped that a whole specimen might be found.

35. \*SEBASTICHTHYS CHRYSOMELAS PURPUREUS var. nov. Two specimens. This seems to us to be a variety distinct from *chrysomelas*. A large number of both this variety and of *chrysomelas* were brought into San Diego market, August 16th.

The supraocular spines are raised much above the surrounding parts. Dorsal in one specimen XIII,  $13\frac{1}{2}$ , in the other XIV,  $12\frac{1}{2}$ . Membranes of all the fins dark greenish tipped with purple. Base of anal yellow. Head and back dark brown; lower portions of sides purple; base of pectoral and its upper half brown tinged with yellow. A purple bar extending from eye downward and backward to subopercle, below which is a greenish band. Gill membranes and membranes below maxillary, the breast and belly dirty yellow. Mandibles purple, the lower lip yellow, the upper slate-blue. Membranes between third and fourth and seventh and eighth dorsal spines purple, the color extending on the back; a similar spot on and below last dorsal spine; sides irregularly blotched with purple, this color not forming a band along the posterior part of the lateral line.



36. *SEBASTICHTHYS SERRICEPS* Jordan and Gilbert. Several specimens from 15 to 25 fathoms. The ground color of the back varies from almost black to very light lavender. The back and the fins of the lighter specimens with many dark spots; the usual black cross bands.

37. *SCORPAENA GUTTATA* Girard. One specimen.

38. \**ICELINUS AUSTRALIS* sp. nov. Types two specimens .04 and .05 m. to base of caudal. 45 fathoms. These specimens were taken from the stomach of *Sebastichthys miniatus* and are partly digested. The anal and dorsal fins have all disappeared. The dentition and armature of the head indicate that this species is closely related to *I. quadriseriatus*, of which it is possibly the young. Its relationship to *Chitonotus* cannot be made out as we have no specimens of that genus for comparison.

Body rounded in transverse section, scarcely compressed in the abdominal region, tapering from the shoulders to the slender tail. Mouth large, the maxillaries reaching beyond pupil. Occiput without ridges or spines. Interocular space slightly grooved, very narrow, its width about one-fourth the diameter of the pupil. Profile straight, upper preopercular spine rather short, simply dilated at the extremity or with a single upward directed spine near its tip, three simple spines below it.

Belly and an interrupted band along the sides white; a series of blackish spots or interrupted band along the sides. Head about three in the length; depth about seven; maxillary two in length of head; eye about three.

*PARICELINUS* gen. nov., Cottidae.

Type *Paricelinus hopliticus* sp. nov.

V. I. 5. Spinous dorsal well developed; gills  $3\frac{1}{2}$ , no slit behind the last; vomer and palate with teeth. Gill membranes (probably) forming a fold across the isthmus. Sides covered with stiff villiform prickles. A series of large plates each ending in a large recurved spine along the bases of the dorsals. Head well armed, the occiput, preopercle, suborbital stay, preorbital, and part of the supraorbital with spines. Nasal spines present; chin with two barbels. Br. 6. Soft dorsal and anal long. This genus is related to *Icelinus*, but differs in the number of ventral rays, armature, etc.

39. \**PARICELINUS HOPLITICUS* sp. nov. Type, a single well preserved specimen .15 m.; from the stomach of *Sebastichthys levis* from 48 fathoms.

D. XII-19; A. 23. Head 4, depth  $6\frac{1}{2}$ .

Elongate, subcylindrical forward, somewhat compressed behind; region between dorsal armature flat.

Snout pointed. Eye large, elevated, 1 in snout,  $3\frac{1}{2}$  in head. Interorbital region with a deep median groove and two shallower grooves, its width less than diameter of pupil. Upper posterior portion of orbit strongly serrate. Posterior margin of preorbital serrate. Suborbital stay with two strong upward directed spines behind the eye. Top of head depressed, a series of

three spines on either side, the posterior two removed from the anterior one. Two small spines above posterior part of each eye. Mouth large, maxillary reaching to below anterior margin of pupil,  $3\frac{1}{2}$  in head. Both jaws with bands of teeth, the outer anterior ones recurved. Vomer and palatines with smaller teeth. A barbel on either side of the lower jaw about as long as the pupil.

Origin of spinous dorsal above the posterior portion of the opercle, its end above the origin of the anal. Caudal broad rounded. Ventrals reaching to second anal ray. Pectoral very broad, reaching the fifth anal ray. A narrow stripe along base of anal naked; head?. Prickles along the lateral line enlarged, forming two series of spinelets along its anterior portion; 34 pairs of strong recurved spines along the sides of the back.

Sides ashy with scattered rusty spots; a series of conspicuous purple spots below the lateral line; lower surface white; dorsal and caudal marked with rusty bars.

40. \*BRACHIOPSIS sp. ? Fragments of the tail from stomach of some rock cod.

41. PORICHTHYS MARGARITATUS (Richardson.) A number taken from the stomachs of rock cod.

42. OTOPHIDIUM TAYLORI (Girard.) Many small specimens from stomachs of various rock cods; two large ones from stomachs of *S. carnatus*.

43. PARALICHTHYS CALIFORNICUS (Ayres.) One small specimen much digested.

44. ? One specimen, all but the caudal digested beyond recognition, the caudal well preserved, black, a white spot near its middle, its margin white.

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### FLORA OF THE ALAMO.

I write these notes on the back of my horse while it slowly follows the well beaten trail to Alamo and Mexican Gulch, Baja California. A landscape gardener might here gather a few ideas by noting the contrasts and shades of coloring presented in the foliage of the native vegetation.

The light pea green of the finely divided even foliage of the deer brush (*Adenostoma sparsifolium*) forms a strong contrast with its congener, *A. fasciculatum*, which is clothed in a dark, olive green. Both are evergreens. Each grows itself separately and naturally, and covers large areas of contiguous land, and are as characteristic of the country and as beautiful as the heaths of the old world, which they somewhat resemble.

Only recently the deer brush, so called because deer are said to be fond of browsing on its tender branches, was covered with a multitude of delicate sprays of pure white flowers, now turned to a light chocolate brown in its fruiting state.

The shaggy bark is of a cherry red color, which adds consid-

erably to its beauty. The young bushes are exceedingly ornamental, and once known would be greatly prized for cultivation.

The broad valley which I have just passed through was overgrown with emerald green grass, closely cropped by a multitude of horses, mules and burros in passing to and fro from the mines. In earlier spring it must have been a lovely spot, as seen from the top of the hill, with the edge of the valley bordered with a strip of the glaucous mountain *Artemisiæ* (*A. tridentata*), forming a band of white around the green, and it in turn surrounded by bushes of olive green. On account of the bluish-white foliage of this graceful bush it also might be used with great effect by landscape artists.

The Golden Rod is just coming into bloom, reminding me of autumn in New England, but scarcely in keeping are the fresh catkins of the "pussy-willow."

Patches of the beautiful deep red *Zauschneria* (*Z. Californica*) occasionally enlivens the dry slopes of some of these valleys.

A dead beef carcass, swarming with bees, just passed, is a reminder of the parable: "Out of the strong came forth sweet." Wild bees are abundant all through these hills, swarming among the rocks, in holes in the ground, and in one place they had attached their comb to a bush simply, not able to find even a vacant crevice for a lodging.

The great bee feed, the white sage, is abundant, but now out of bloom. Another great source of honey for the bees, the wild buck-wheat, (*Eriogonum fasciculatum*) is likewise nearly out of bloom, but its more modest congener, (*E. Wrightii*), is in full bloom, but the slender spikes of white blossoms might easily escape observation.

The cardinal mimulus is one of the striking flowers now to be found along the water courses, growing in large masses or bordering running streams with a profusion of showy flowers. It grows abundantly in moist places from a foot to four feet in height, with a light green, slightly sticky foliage.

Above it rise the tall slender stems of a species of wild sun flower (*Helianthus Californicus*), ten to a dozen feet in height, surmounted by golden disks.

Since writing the above I have followed up a little stream of clear running water, for a couple of miles and passed a lovely waterfall. Clumps of the tea fern are fresh and green, as also patches of selaginella moss (*S. rupestris*). Willows border the creek, with occasionally a live oak tree, an elder or other species of trees or shrubs along the banks.

A species of wild lilac (*Ceanothus*) turns its leaves to the sun, conspicuous among the other shrubs for the silvery lustre on its foliage. As I approach Mexican Gulch, I find numerous clusters of the silver and the Cleveland ferns, both as green and fresh, owing to a recent shower, as they are in the spring.

The wild almond, the tree poppy, the oak-leaved cherry, the sugar tree (*Rhus ovata*), and manzanitas are among the other

notable shrubs. The *floris de asusana* of the Mexicans, our own magnificent *Romneya*, is also abundant on these hills.

Among the cacti are to be found a species of *Echino cactus*, a wild tuna and a cholla, and the beautiful *Cereus Engelmanni*. The wild date (*Yucca baccata*) and the coyote plant (*Y. whipplei*) with *Nolina Palmeri*, the latter the sotote of the Mexicans, or vegetable soap, are all abundant.

Lovely beds of verbenas were abundant through Mexican Gulch, as beautiful as if they were cultivated in a hothouse.

Live oaks were not rare near the trail in places, and two varieties of scrub oaks were abundant, the *Quercus pungens* and *Q. palmeri* of botanists. The low bunches of *Quercus pungens* were frequently covered with small round galls of most beautiful and delicate coloring, red, white and green in different tints. The whole bush was frequently covered with these, which some very naturally mistake for the fruit of the shrub.

Juniper is perhaps the most abundant shrub near the mines and furnishes the main supply of wood at Alamo. It forms a low bushy tree, with dark green foliage, easily distinguished from the other brush at a distance. It would seem to be well adapted for cultivation as an ornamental shrub but may not prove desirable.

The color of the rocks in a landscape is often one of the characteristics of a country, and a no small factor in producing the pleasing effect upon the eye in the scenery of California is the great variety of rock lichens everywhere prevalent. Red, yellow, grey and white are the prevailing colors observable here, and the whole side of a cliff is often covered by lichens of the same tint. How many valuable mines may be hid from the prospector's keen eye by these deceptive colorings? Quartz, however, is not a favorite rock with the lichens and consequently is seldom concealed, while the lichens also frequently imitate in coloring the natural color of the rocks on which they are found.

*C. R. Orcutt.*

*CONTRIBUTIONS TOWARDS A LIST OF THE  
FAUNA AND FLORA OF WEST MOUNTAIN VALLEY, COLORADO. II.*

(Compiled for the Colorado Biological Association.)

III.—MONOCOTYLEDONOUS PLANTS.

This list will be greatly augmented when the various species of grasses and sedges collected have been identified. For the Liliaceæ and Orchidaceæ it is probably fairly complete. For identifications we are indebted to the kindness of Dr. Geo. Vasey, Dr. J. M. Coulter, and Miss A. Eastwood.

1. *Calypso bulbosa*, L. Porter and Coulter, "Fl. Colorado." This is *C. borealis*, Salisb.

2. *Corallorhiza multiflora*, Nutt. Collected by Mrs. M. Howard of Ula.

3. *Listera convallarioides*, Nutt. Near Short Creek (Mrs. M. E. Cusack.)
4. *Habenaria hyperborea*, R. Br. Common by creeks over 8,000 feet in the Sangre de Cristo Range.
5. *H. dilatata*, Gray. Porter and Coulter, "Fl. Colorado."
6. *H. obtusata*, Richardson. Collected by Mrs. M. E. Cusack.
7. *Spiranthes romanzoffiana*, Cham. Near Ula, in open damp ground, not rare.
8. *Cypripedium parviflorum*, Salisb. Near Swift Creek, etc.
9. *Iris missouriensis*, Nutt. Very abundant.
10. *I. missouriensis albiflora*, Ckll., sparingly with the type.
11. *Sisyrinchium anceps*, L., abundant in damp meadows.
12. *S. anceps pallidiflorum*, flowers very pale bluish, almost white. Near Ula, locally common.
13. *S. mucronatum*, Michx., near Short Creek, rather rare. Grows on drier ground than *anceps*, and is probably a variety of it.
14. *Hypoxys juncea*, Smith, found near West Cliff by Miss Eastwood.
15. *Allium mutabile*, Michx. Porter and Coulter, "Fl. Colorado."
16. *Allium reticulatum*, Fraser, id. loc. cit. We doubt whether this occurs below 10,000 feet.
17. *Allium nuttallii*, Wats. A species referred to this is found at West Cliff.
18. *Allium cernuum*, Roth, var., West Cliff.
19. *Leucocrinum montanum*, Nutt., common in early spring.
20. *Yucca angustifolia*, Pursh., very common.
21. *Polygonatum canaliculatum*, (Willd.), Pursh. From information received from Mrs. M. E. Cusack it appears that this grows near Brush Creek.
22. *Smilacina amplexicaulis*, Nutt., in herb. M. E. Cusack, collected in 1888.
23. *Smilacina stellata*, Desf., exceedingly abundant.
24. *Streptopus amplexifolius*, D. C., very common at about 8,300 feet.
25. *Lilium philadelphicum*, L., abundant.
26. *Lilium philadelphicum pulchrum*, Aldrich. With the type, rare.
27. *Calochortus gunnisoni*, Wats., abundant. A parasitic fungus (*Vermicularia dermatium*, Fr.) occurs upon it.
28. *C. gunnisoni maculatus*, Ckll., frequent, being the form with the markings of the flower best developed.
29. *C. gunnisoni immaculatus*, Ckll., not rare, near Short Creek.
30. *C. gunnisoni purus*, Ckll., near Short Creek, often on drier ground than the other forms.
31. *Veratrum californicum*, Durand. Abundant, this year (1889) severely attacked by *Puccinia veratri*.

32. *Zygodenus elegans*, Pursh. Common.
33. *Zygodenus nuttallii*, Gray. Porter and Coulter, "Fl. Colorado."
34. *Luzula spadicea*, D. C.
35. *Luzula spadicea parviflora*, Meyer.
36. *Juncus balticus*, Deth. Very abundant.
37. *Juncus mertensianus*, Meyer. Porter and Coulter, "Fl. Colorado."
38. *Typha latifolia*, L., id. loc. cit.
39. *Sparganium simplex*, Huds., id., loc. cit.
40. *Lemna trisulca*, L., West Cliff.
41. *Lemna minor*, L., West Cliff.
42. *Cyperus filiculmis*, Vahl.
43. *Cyperus schweinitzii*, Torr. Porter and Coulter, "Fl. Colorado."
44. *Scirpus maritimus*, L., id., loc. cit.
45. *Eriophorum polystachyum*, L., var., with channelled leaves. West Cliff.
46. *Hemicarpha subsquarrosa*, Nees. Porter and Coulter. "Fl. Colorado."
47. *Carex douglasii*, Boott. A species abundant in spring in open ground is referred with doubt to this.
48. *Carex aurea*, Nutt.
49. *Carex echinata microcarpa*, Bcklr. Porter and Coulter, "Fl. Colorado."
50. *Andropogon scoparius*, Michx.
51. *Hierochloa odorata* (L.)=borealis, R. and S.
52. *Stipa spartea*, Trin. Porter and Coulter, "Fl. Colorado."
53. *Phalaris canariensis*, L. West Cliff, introduced.
54. *Danthonia sericea*, Nutt. Porter and Coulter, "Fl. Colorado."
55. *Phleum pratense*, L. Cultivated, and occasionally an escaped casual.
56. *Sporobolus depauperatus*, Torr. Porter and Coulter, "Fl. Colorado."
57. *Agrostis scabra*, Willd.
58. *Boutelona oligostachya*, Torr. Very abundant on dry, open ground.
59. *Catabrosa aquatica*, Beauv. Porter and Coulter, "Fl. Colorado."
60. *Poa andina*. Common on open ground, spring.
61. *Bromus ciliatus*, L. Porter and Coulter, "Fl. Colorado."

*T. D. A. Cockerell.*

CONTRIBUTIONS TO WEST AMERICAN BOT-  
ANY—II.

LENNOACEÆ.

PHOLISMA ARENARIUM, Nutt., Hook Ic. Pl. t. 626; Watson Bot. Calif., i., 464. A purplish-brown fleshy herb, parasitic on the roots of various shrubs, most commonly growing in sandy soil. The usually simple stems puberulent, an inch or more thick, clothed with small erect scales, three to six inches in height above ground and penetrating the earth or sand to a depth of three to twelve inches where connection is made with the foster root. Spike more or less capitate, dense, the purplish sessile flowers about four lines in length.

No doubt this plant like the *Ammobroma*, was utilized by the Indians for food, but the scarcity of Indians has prevented my verifying this supposition. It extends from near Monterey (Douglas), southward to San Diego (Nuttall and others) into Lower California. C. G. Pringle collected it in 1882 on the roots of a species of *Bigelovia* in the Mojave Desert, San Bernardino county. I have found it in the vicinity of San Quintin bay, Lower California; in proximity to *Quercus Dunnii*, Kell. in the mountains; and in other parts of the peninsular. It is found abundant near San Diego on the roots of *Eriodictyon tomentosum*, Benth., flowering in May, and I found it very plentiful on the Colorado Desert in April of this year (1889) and at intermediate points in the mountains.

AMMOBROMA SONORAE, Torr. Ann. Lyc. N. Y., viii., 51, t. 1; Watson, l. c. Dr. Edward Palmer re-collected this interesting plant this year at the head of the Gulf of California. It is a plant much resembling *Pholisma* in size and character, growing from twelve to eighteen inches deep in very sandy soil, and parasitic on the roots of several species of plants. The plant is watery and eaten raw by the Cocopa, Yuma and Diegeno Indians. Dr. Palmer describes the taste as resembling that of the heart of a cabbage. The original discoverer, Col. A. B. Gray, described the fresh cooked plant as "luscious, resembling the sweet potatoe in taste, only more delicate." It is also eaten by the Papago Indians, of Sonora, after roasting or drying in the sun. The Indians call it "sand-food" in their language, and in that arid region seek it on account of its juiciness.

C. R. Orcutt.

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BRIEFER ARTICLES.

(From Demorest's Monthly Magazine.)

MARIA MITCHELL.—The noted astronomer Maria Mitchell died at Lynn, Massachusetts, on June 28, of a brain disease from which she had been suffering from some time. The career of this talented woman began early in life and lasted an exceptionally long time. Miss Mitchell was born on the island of Nan-

tucket, Massachusetts, on August 1, 1818. Her father was William Mitchell, a teacher and astronomer, and Maria, when only eleven years of age, became his assistant in his astronomical observations and computations, and acquired her education under her father's tuition. At eighteen years of age, Miss Mitchell was appointed librarian of the Nantucket Athenæum, which position she filled for twenty years. She still pursued her studies and researches in astronomy, and on October 11, 1847, she discovered a comet, and this discovery introduced the young astronomer to the notice of the world; she received a gold medal from the King of Denmark and a copper medal from the Republic of San Marino, Italy. In 1858 she visited Europe, and while there was the honored guest of Sir John Herschel and Sir George B. Airy, Le Verrier and Humboldt. The women of America, under the leadership of Miss Elizabeth Peabody of Boston, presented Miss Mitchell, upon her return, with a large telescope. In 1865 she was appointed Professor of Astronomy and Director of the Observatory at Vassar College, which post she retained until January, 1888, when she offered her resignation. This the trustees refused to accept, but granted her an indefinite leave of absence. She was employed in certain work for "The American Nautical Almanac" for some time, even after her appointment as a professor at Vassar. Of late years Miss Mitchell had made the study of sun-spots and the satellites of Jupiter and Saturn her special object. She was the first woman elected to membership in the American Academy of Arts and Sciences. In 1852 Dartmouth College conferred upon her the degree of LL. D., and Columbia honored her with the same degree in 1887. Her published writings were wholly upon scientific topics, if we except a few poems contributed to a book entitled "Sea-weeds from the Shores of Nantucket," published in 1853.

A RIVAL OF INDIAN CORN.—A possible rival to Indian corn has been lately added to the food-plants produced in this country. This new plant is called sweet cassava, and is closely related to the *Ricinus*, or castor-bean, which it resembles, although it is a handsomer plant than *Ricinus*. It bears very little seed, and is not propagated from seed, but from cuttings of the larger stems; and the roots produce great tubers, sometimes three or four feet in length, which seem to be a most wholesome article of food for men or cattle. By manufacture, cassava may be converted into starch, tapioca, and glucose, with scarcely any waste. In the tropics, cassava flour is used for making crackers or wafers, which are very palatable and will keep for months; and Florida housekeepers have used it for making bread, puddings, custards, etc., while as a vegetable it may be cooked in all ways that white potatoes are. On the southern border of the United States there are considerable areas admirably adapted to growing this remarkable plant as a staple article of home con-



sumption; and its manufacture into starch, tapioca, and glucose, may become a leading industry in Florida. As to the yield per acre, no satisfactory estimate has yet been made; it will probably vary greatly under various conditions. A single plant has been known to produce fifty pounds of tubers, but this is exceptional. Certainly, however, the plant will yield enormously under favorable conditions, and its uses are so numerous that it cannot fail to soon become a staple product.

**A BURIED CITY.**—A buried city, hitherto unknown to the civilized world, has been lately discovered in Olancho, Honduras, and Mr. A. J. Miller has obtained from the Honduras government the exclusive right of excavation. The ruins were found in the new Department of Mosquito, about two hundred and fifty miles from the mouth of the Partook River. They may be approached only by the river, no path or track leading to them for miles. The Central American Indians of this region are the Peyas, but none of their traditions point to the existence of these ruins, which antedate the oldest civilization. The ruins, half-buried under the debris of ages and overgrown by a great forest, are about two miles square in extent, and show evidence of having been a city surrounded by a wall. Within the city was discovered an immense workshop where ancient Indian sculptors worked. Many beautiful designs in white granite—a stone which is found nowhere else in this immediate section of Honduras—have already been found. Immense tablets of stone, bowls on three legs, carved blocks of various sizes, weighing from twenty-five to six hundred pounds, urns and vases ornamented with curious hieroglyphics, or heads of snakes, turtles, tigers or rude human forms, were found among the relics. Further excavations will undoubtedly reveal still more rare treasures of great antiquity.

**INTELLIGENT SWALLOWS.**—France is threatened with a peculiar calamity, and has been warned thereof by the Zoological Society. It seems that the fancy for using swallows as a millinery garniture has led to a line of campaign against them which the intelligent little migrators have noticed. Wires connected with electric batteries have been laid along the coast of the Department of the Bouches du Rhone, which is one of the great landing places for swallows coming from Africa, and the birds, wearied with their flight across the Mediterranean, perch upon the wires and are struck dead. Their bodies are then prepared for the milliner and sent by cratefuls to Paris. Thousands of swallows have been yearly disposed of in this way for some years; but this last spring the swallows demurred against this wholesale manner of electrocution, and landed further east and west. The gnats and other flying insects on which they live did not join in the boycott, however, and the loss to agriculturists threatens to be very serious unless the swallows again take up their summer quarters in France.

**ARTIFICIAL SILK.**—An eminent French chemist, M. Chardonnet, has succeeded in producing a new textile fabric which bears the same relation to silk that celluloid does to ivory,—in short, an artificial silk. The production from celluloid of photographic films for the Eastman dry-plate process is one of the latest triumphs in that line of manufactures, but this new material seems yet more wonderful. It is prepared from cellulose (cotton, or other available substance of that nature), which, after being treated with a mixture of nitric and sulphuric acids in equal proportions, as for the making of gun-cotton, is dissolved in a mixture of alcohol and ether, to which is added some perchloride of iron or protochloride of tin and tannic acid. The solution thus obtained is placed in a vertical vessel terminating in a small tube, or in a diaphragm pierced with fine holes, so that it can run out into a vessel full of water slightly acidulated with nitric acid. A fine fluid filament comes out from this, which immediately takes on a solid consistency and forms a thread which can be wound on a spool. The thread thus obtained resembles silk very closely, and has the same tenacious, elastic qualities. Water, cold or warm, has no effect on it, nor have acids and alkalis moderately concentrated. Any desired shade of color may be obtained by introducing coloring materials into the solution. One objection to this artificial silk is that it is extremely inflammable. Possibly this objection may be overcome by replacing the nitric acid with some other which will render it less combustible. When this is accomplished the new fabric will become useful.

**FLOWERS IN ICE.**—At expositions where medals of honor and prizes have been given for artificial ice, flowers may have been seen in ice. The exhibitor has had the children of the sun frozen in the ice to show how beautifully clear and transparent it was. But there are flowers that grow in the ice and unfold their blossoms there. To see such a wonder one must climb high in the Alps, to those regions where the glaciers are formed of the snow which becomes ice. The Alpine guides call the half-formed ice, *firn*. Coming in August to the edge of a firn-field, if fortune favors us we shall be surprised by a rare sight. Out of the snow fresh blooming flowers lift their heads, often in such quantities that ten or twenty flowers may be seen in the space of a square yard. One of these flowers especially attracts us,—the blue blossom of the soldanel. Its evergreen leaves grew on the earth beneath the sheet of firn; the stalks have been already prepared the year before, and have attained a scarcely perceptible height at a zero temperature. But when the summer sun again begins to melt the firn, and little rills of water flow under its covering, at a temperature never exceeding the point at which ice melts, the plant awakens to new life. The flower-stalks begin to grow buds, the warmth generated by the breathing of the plant melts the granular ice in the firn-field, and the soldanel

bores a way through the ice, until its violet buds reach the upper surface and unfold into blossoms. But all the soldanels do not reach the surface; many of them remain prisoned in the ice, yet they do not perish. Cutting with ax and spade through the firn, single soldanels will be found, which have opened their blossoms before reaching the top. Such soldanels actually blossom in a little cavity in the ice, and resemble those plants or insects that are found embedded in amber or blown into glass balls. But the ice-flowers are alive, although they are somewhat crowded for room, and only push out their anthers while their petals remain folded. But if the soldanel blossoms are carefully taken out of their little ice-houses and their closed petals blown apart, the pollen may be seen to fly out.

**SNIPE SURGERY.**—An interesting account of how birds treat wounds by surgical methods was recently presented to the Physical Society of Geneva by M. Fatio. In this it was stated that the snipe had been observed to apply a dressing of feathers to wounds, and even to bandage a broken leg. Any creature with legs as long and brittle as a snipe's ought really to know how to take care of them. A case recorded of a snipe, both of whose legs had been broken by a misdirected shot, is the most interesting example of snipe surgery. The poor creature contrived to apply dressings of feathers and a sort of splint to both limbs, but unfortunately, in doing so, its beak got wound fast with feathers, and, as it could not use its claws to get rid of them and open its mouth, it was nearly dead from hunger when it was found. In another case, a snipe that flew away with a broken leg was afterwards found to have forced the fragments into a parallel position and secured them by a ligature of a kind of flat-leaved grass wound around the limb spirally and fixed by a glue-like substance.

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#### *PROCEEDINGS OF SCIENTIFIC SOCIETIES.*

**SAN FRANCISCO MICROSCOPICAL SOCIETY.**—August 28, 1889. President Payzant occupied the chair. A large and interesting budget of current microscopical literature was added to the files.

The library was augmented by a number of valuable works on optics and microscopy, while the cabinet was enlarged by a series of mounted slides, mounting material and miscellaneous accessories, a gift from the society's late associate, F. L. Howard. The donation was accompanied by a letter from Mrs. Howard, setting forth the wishes of the departed member. A sincere vote of thanks and appreciation for the testimonial was tendered the lady by the members, and the collection will be known as The Howard Memorial.

Mr. Wickson presented a large collection of diatoms in situ, a donation from Professor George Davidson of the United States Coast and Geodetic Survey. They come from the northern end

of Lopez Island, in Washington Sound, W. T., and will form a valuable addition to the society's working material. The diatoms were accompanied by a sample of supposed diatomaceous earth found near Santa Rosa. E. H. Griffith, of Fairport, N. Y., one of the society's corresponding members, donated a beautiful series of mounted slides, illustrating the gorgeous skeleton of the Diamond beetle or *Eupholus Linnei*. The glittering scales covering the body of this member of the weevil family form one of the most brilliant objects that can be presented to the eye under the microscope.

C. C. Riedy exhibited a large collection of mounted diatoms from the hand of the noted specialist in that line, C. L. Petticolas. A slide prepared by that gentleman of the recently discovered Redondo Beach earth found some miles south of Santa Monica, is thought by him to be fully equal to the celebrated piece discovered at Santa Monica several years ago and published to those interested in this branch of microscopical research by the investigations of the late Professor William Ashburner. Another remarkable slide in the collection exhibits what is known as the Eight-street Tunnel diatomaceous deposit of Richmond, Va., one of the finest deposits of strewn diatoms ever found. The slides of fossil marine diatoms from Syzran, Russia, and Kekko, Hungary, are also notable for the variety of their forms and the skillful manner in which they have been prepared before mounting.

A request from the Richmond Microscopical Society for an exchange of material was cordially responded to and the secretary instructed to effect the desired exchange.

F. W. Dunning of Battle Creek, Mich., forwarded a box of diatomaceous earth from Lyons creek, Calvert county, Md. The same gentleman also sent a sample of diatomaceous earth broken from a piece found by a fisherman some time in June last floating in the Pacific Ocean, about two miles off the coast of Santa Monica. The latter material will be examined and compared with the original Santa Monica diatoms to determine whether it contains the same variety of forms.

Dr. Riehl exhibited a pure culture of *Staphylococcus pyogenes aureus*; also, a stained and mounted specimen of same.

C. P. BATES,  
Recording Secretary.

SANTA BARBARA SOCIETY OF NATURAL HISTORY.—August 31, 1889. Dr. L. G. Yates presented specimens of *Helix Ayeriana*, Newc., a land snail peculiar to the Channel Islands, and stated that he had planted a colony of these snails on the mainland near Montecito valley. Prof. H. C. Ford, the president, reported the discovery of a probably new species of bird in British Columbia, by Clark P. Streater.

A preliminary paper on the Geology and Natural History of the Anacapas was read by Dr. L. G. Yates, who exhibited beau-

tiful specimens of chalcedonic quartz, showing cavities lined with drusy crystals, from the islands, and also amygdaloid basalt, the cavities of which were filled with fine chalcedony. Photographs of the scenery, insects and curiosities were also shown.

The president and corresponding secretary were appointed a committee on publication, to consider the question of issuing other bulletins.

L. G. YATES,

Corresponding Secretary.

NEVADA ACADEMY OF SCIENCE.—September 6, 1889. At this meeting a paper was read on the Circulation of Air Currents in Western Nevada, by Gen. C. W. Irish. This was the first working meeting of this new scientific association, organized at Reno, Nevada, with the following officers: President, Gen. C. W. Irish, Surveyor-General of Nevada; Vice-President, C. W. Friend, Director of Nevada State Weather Service; Secretary, Prof. R. D. Jackson, State University; Treasurer, Dr. J. M. Rankin, Bishop Whitacre's School for Girls; Executive Committee, Gen. C. W. Irish, Prof. R. D. Jackson, Dr. Le Roy D. Brown, Prof. W. McN. Miller, E. M. Van Harlengen.

W. S. DEVOL.

THE ASTRONOMICAL SOCIETY OF THE PACIFIC.—July 28, 1889. Lick Observatory, Mt. Hamilton. It was announced that the report of the solar eclipse of last January now being printed by order of the Regents of the University, had reached page 60, about a third of the volume. It contains reports from more than 150 persons distributed at twenty-five different observing stations.

C. F. Crocker has offered to bear the expenses of an expedition from the Lick Observatory to Cayenne, South America, next December, and it is expected at that time to confirm and extend some of the discoveries made at the last eclipse. The announcement was also made that Joseph A. Donohue of Menlo Park had founded a medal to be given for the discovery of comets, and had provided a permanent fund for the purpose. This gift was gratefully accepted by the society.

The papers read either by title or in full were as follows: "The Possibility of Photographing the Corona in Full Sunshine," by Mr. Keeler; "The Orbit of Comet Barnard," by Mr. Leuschner; and "The Occultations of Jupiter to be Expected in 1889," by Mr. Hall. A photograph of the Milky Way near Jupiter, taken the 24th inst., with one hour and forty-eight minutes exposure, was exhibited by Mr. Barnard. This picture was shown to illustrate "The Real Shape of the Nebulæ," by Mr. Holden. Its purpose is to show the real shape of the so-called spiral nebulæ in a space of three dimensions as deduced from their apparent shape as projected in two dimensions on the background of the sky. This is a problem that has had no solution up to this time, and it is one that has important bearings, not only

upon the question of the construction of the spiral nebulae, but also upon the much larger question of the constitution of the solar and stellar systems, and of the universe as a whole.

The affairs of the society are in a prosperous condition, owing to the great interest taken in its progress by the members. It is essentially a society for amateurs, and desires to include in its membership every person in California who takes an interest in astronomy, whether he has made studies in this direction or not. Several ladies are already members. The annual dues are \$5 and there is no initiation fee. Life membership \$50. The publications are sent to every member, and three of its six meetings are held in San Francisco. The scope of the society is defined so that it can have no possible rivalry with any other. Its sole object is to forward the study and the science of astronomy.

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#### BIBLIOGRAPHY.

C. C. PARRY.—*Ceanothus*, L., recent field notes, with a partial revision of the species. Proc. Davenport Academy of Natural Sciences, V. pp. 185-194. *C. tomentosus*, *C. Lemmoni* and *C. Orcuttii* are three new Pacific Coast forms described in this paper.

TH. RIBOT.—*The Psychology of Attention*. This interesting contribution to psychological literature, by the author of the "Diseases of the Will," the "Diseases of Memory," and the "Diseases of Personality," has, like them, been translated into English and presented in the Humboldt Library (28 Lafayette Place, N. Y.). The present work, like the others, is a study of very recondite problems of psychology—the nature and workings of the mind of man—presented in language understandable by every intelligent reader, and is both instructive and highly entertaining.

SHERMAN F. DENTON.—*Incidents of a Collector's Rambles in Australia, New Zealand, and New Guinea*. Lee & Shepard, Boston, 1889. Price, \$2.50. This very attractive volume of 272 pages, with numerous illustrations by the author, artist to the U. S. Fish Commission, Washington, D. C., consists of an entertaining narrative of a true naturalist's experiences, intermixed with notes on the birds, animals, insects and flowers of the lands visited. Many amusing anecdotes are related and altogether it is a delightful and instructive book to peruse—not "too scientific" for any reader.

E. L. BERTHOUD.—*Birds, Their Migration and Uses*. Golden, Colorado, 1887. 8vo. 22 pp. This little paper, just received from the author, treats of the geological history of birds, and especially of their economic and industrial relations to cereal and fruit culture.

HORACE F. CARPENTER.—A catalogue of the shell-bearing

mollusca of Rhode Island, second edition, 1889. The list enumerates 216 species in the State.

P. C. REMONDINO.—The climate of Southern California in its relation to renal diseases. Reprinted from Southern California Practitioner. An able discussion of the effects of climate on health. The writer sums up his conclusions as follows: "The even equable temperature of insular regions, where for a whole year the weather is about alike in temperature, is the best and healthiest of climates. The localities where such a climate exists, with the temperature sufficiently low to meet all requirements, and at the same time having soil, sunshine, rainfall, winds and other climatic conditions favorable, are not many. There is possibly one place in the United States that such conditions obtain—a bit of country of about forty square miles, at the extreme southwestern part of the United States,' says Gen. Greely, Chief Signal Officer of the United States. One all important benefit of our climate not to be lost sight of is the fact that it is not a climatic season resort—it *has no season*—it is for the whole year—a fact that permits of removal to this region with a view to a permanent home as the rapid developments of its varied resources promises to make Southern California the home for millions of inhabitants."

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#### EDITORIAL.

The earlier numbers of the WEST AMERICAN SCIENTIST are rapidly becoming rare. A few copies, especially numbers 1 and 2, are greatly desired to complete sets, and a liberal price will be paid by the publishers to anyone who can oblige us by supplying these.

The larger portion of September was spent by the editor in Lower California, revisiting many interesting localities. Several places were reached that had not before been explored and some remarkable discoveries were made. A fine species of Pinna was discovered measuring two and a half feet in length, fairly well preserved, with many other fossils. A species of Nautilus over two feet in diameter, at least four species of coral, and numerous other interesting fossil remains were discovered and will form material for future articles for this magazine.

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#### NOTES AND NEWS.

The Ornithogists and Oologists' Directory, just issued by Messrs. Menefee & Corlees, San Jose, Cal., gives the addresses of seventy-two collectors in California.

The National Magazine begins an existence in Chicago this month, as the organ of the National University, an institution said to be modeled after the London University, with extensive non-resident courses, teaching many subjects by mail. Published at 182 Clark street.

New York, Chicago and St. Louis are rivals for the honor of the next great World's Exposition, which will commemorate the 400th anniversary of the discovery of America.

Wm. C. Strong, in Garden and Forest, favors transplanting evergreen trees in August instead of in spring. The latter method is often unsatisfactory.

A new powder has been invented in Europe, which in firing gives out but a slight vapor and hardly any report. Troops furnished with this smokeless and noiseless powder executed all movements with ease without annoyance of obscuring clouds of smoke.

A schooner recently picked up in the Atlantic ocean what resembled a chunk of grease floating in the water. It proved to be ambergris, worth thirty dollars an ounce. The mass weighed about fifty pounds.

Watches are now being made to run by electricity, that require no attention for a year after starting.

Typewriters will soon be placed on the market so small that one can carry one in his vest pocket without inconvenience. They will do as good work as the large and expensive machines, it is claimed, and will cost less than \$2.50.

A young man in Virginia is reported to be absolute proof against electricity.

Henry Shaw, of St. Louis, founder of the Shaw Botanic Garden, died recently at his home. The Agave Shawii, of San Diego, was named for him by his friend Dr. Engelmann.

The publishers of *St. Nicholas* announce that that popular childrens' magazine is to be enlarged, beginning with the new volume, which opens with November, 1889, and that a new and clearer type will be adopted. Four important serial stories by four well-known American authors will be given during the coming year.

During the coming volume *The Century* is to have an illustrated series of articles on the French Salons of the seventeenth and eighteenth centuries, including pen portraits of many of the leaders and a detailed account of the organization and composition of several historical salons. A great number of interesting portraits will be given with the series.

The Italian Admiralty have recently caused to be carried out a number of experiments with a view of testing the comparative merits of castor oil and olive oil for lubricating purposes on board ship. From the results obtained they have given orders that henceforth all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinder and similar lubrications.

Persons who have been experimenting as to the comparative value of trees in different localities are inclined to the opinion that the willow and the Norway spruce are the most valuable varieties for planting on the vast plains of the west for protection of crops and houses against destructive winds.



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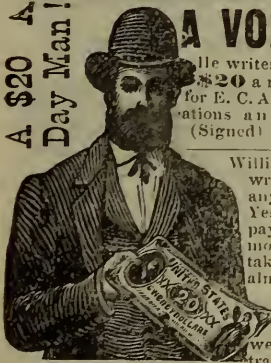
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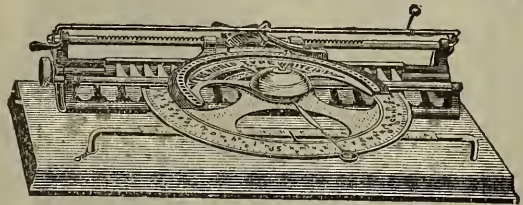


**A VOICE** from Ohio. Here is a portrait of Mr. Garrison, of Salem, Ohio. He writes: "Was at work on a farm for \$20 a month; I now have an agency for E. C. Allen & Co's albums and publications and often make \$20 a day." (Signed) W. H. GARRISON.

William Kline, Harrisburg, Pa., writes: "I have never known anything to sell like your album. Yesterday I took orders enough to pay me over \$25." W. J. Elmore, Bangor, Me., writes: "I take an order for your album at almost every house I visit. My profit is often as much as \$20 for a single day's work." Others are doing quite as well; we have not space to give extracts from their letters. Every one who takes hold of this grand business piles up grand profits.

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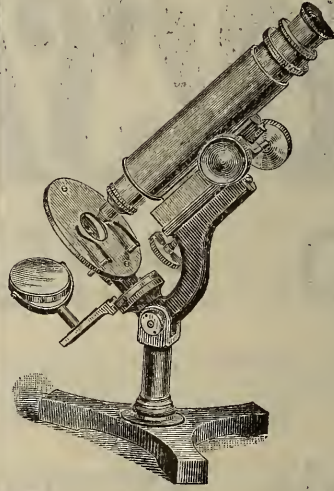
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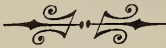
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# THE WEST AMERICAN SCIENTIST.

VOL VI

NOVEMBER, 1889.

No. 49.

## NOTES FROM THE SAN DIEGO BIOLOGICAL LABORATORY.

### II.

#### ADDITIONS TO THE FAUNA OF CORTEZ BANKS.

In a trip to the Cortez Banks, subsequent to the one on which the fishes noted in the first part of these notes were collected, Captain Carter obtained the following species.

45. SPHYRNA ZYGAENA. (L.) August.

46. ECHENEIS REMORA. L. On Sphyrna zygaena.

47. DITREMA ATRIPES, Jordan & Gilbert. A single specimen of this species was caught with hook and line in 45 fathoms. August, 1889.

It differs somewhat from the description of atripes. The lips are black, a black spot at root of mandible. Pectorals hyaline, a narrow black bar at their base, especially well defined on their inner surface. Ventrals dusky, most so at tip. Upper third of first ten anal rays black. Caudal dark. Sides gray, lighter below, the back being bluish.

D. X, 22; A. III, 28½. Scales 7-70-15.

From *D. orthonotus*, this species differs in its arched back and less inclined anal basis.

48. CHROMIS PUNCTIPINNIS (Cooper)—A single specimen. It is undoubtedly identical with Cooper's *Ayresia punctipinnis*. It differs from the specimens described by Jordan and Gilbert. (*Syn. Fish. North Am.* 611) in having the dorsal XIII, 11 instead of XII, 11 and the depth  $2\frac{6}{7}$  instead of  $2\frac{1}{3}$ . Since writing this, Dr. Jordan has examined a specimen in his collection with the dorsal as above XIII, 11 and the depth  $2\frac{4}{7}$ .

49. OPHIODON ELONGATUS Girard—One specimen from the Cortez Banks.

50. ZANIOLEPIS FRENATUS sp. nov. Type, one specimen, 165 m. Cortez Banks, Capt. Carter, Coll.

This species is very closely related to *Z. latipinnis* of Girard. It differs from that species in the less convex profile, the more slender shoulder, lower dorsal spines and color.

D. XX, 1-12; A. III, 16½; head  $4\frac{1}{3}$ ; depth  $6\frac{3}{4}$ .

General form of *Z. latipinnis*, the body less compressed, the dorsal outline less arched. Profile gently arched; nasal spines

prominent. Eye longer than snout, 3 in the head. Mouth small, lower jaw included, maxillary reaching to the anterior margin of pupil. Three preopercular spines, the lowest flat, triangular, the others conical.

Second and third dorsal spines highest,  $1\frac{1}{2}$  in length of head, the spines gradually shortened to the 20th. Ventrals reaching front of anal; pectorals scarcely to tip of ventrals.

Color in alcohol, olivaceous; suborbital and preorbital black, (the corresponding region in *latipinnis*, bluish silvery.) Dorsal and anal with large blackish spots; posterior half of pectorals dusky.

51. *FIERASFER DUBIUS* Putnam—A mass of larvæ and eggs imbedded in a transparent jelly-like matrix may be provisionally referred to this species.

ADDITIONS TO THE FAUNA OF SAN DIEGO, WITH NOTES ON  
SOME RARE SPECIES.

*SPHYRNA ZYGAENA* (L.)

*MYCTOPHUM*—Sp. A single specimen from the Cortez Banks which was referred to *M. townsendi* differs from that species in some respects. The occiput is more elevated, the preopercular margin is less inclined, agreeing with *M. californiense*. As far as evident, the phosphorescent organs agree with those of *townsendi*; there is, however, no light area along the base of the anal. D. 13. A. 15. A single specimen of this species was taken out of the mouth of a Rock Cod caught a few miles off Point Loma.

*MENIDIA TENUIS* (Ayes)—This species has not been observed by us during the past year before Sept. 11th, when a large number were brought into the market. All the specimens examined by us have distinct bands of teeth and if the alleged absence of teeth in this species is the only character, as stated by Jordan and Gilbert., Syn., N. A. Fishes, 405, separating this species generally from *Menidia*, it must be placed in that genus.

*ECHENEIS REMORA* L.—Found on every specimen of *Sphyrna zygaena*.

*XENISTIUS CALIFORNIENSIS* (Steindachner)—Raspers.

This species has so far been very rarely found. Steindachner found it in San Diego Bay, (*Ichthyol. Beitr.* III. 3. 1875) and Streets at Cerros Island, (*Bull U. S. Nat. Mus.*, VII. 49), since then the species has been noted but once, having been collected by Rosa Smith in '85. The specimens collected by her are now in the Museum of the Indiana University. On May 3d, '89 we procured a single specimen; the latter part of August and during September of this year they were very abundant about the wharfs in San Diego Bay, as many as twenty being caught in a day by a single person with hook and line. When they are pulled from the water they grate their pharyngeals together producing a noise like that of a rasp. Silvery below, steel blue above, lateral stripes rust color.

RHACOCILUS TOXOTES Agassiz—A single specimen. October 3d.

SEBASTICHTHYS MELANOPS (Girard)—Not rare in the markets in Summer and Fall.

SEBASTICHTHYS OVALIS Ayres—Not rare.

SEBASTICHTHYS RUBER (Ayres)—Not rare, usually large individuals brought to the market.

SEBASTICHTHYS LEVIS Eigenm and Eigenm—Equally abundant as *S. ruber*, none but large individuals seen.

SEBASTICHTHYS ROSACEUS (Girard)—Common.

SEBASTICHTHYS ELONGATUS (Ayres)—Not rare.

SEBASTICHTHYS RUBROVINCTUS Jordan and Gilbert—The rarest of the Rock Cods.

XYSTREURYS LIOLEPIS Jordan and Gilbert—Three specimens, Sept. 30th and Oct. 3d.

FISHES OF ÆTNA SPRINGS, NAPA COUNTY, CALIFORNIA.

PHOXINUS (Tigoma)CLEVELANDI sp. nov.—Types, three specimens .10-.12 m. to base of caudal. D. Cleveland, Coll.

Closely related to *Ph. hydrophlox* (Cope) associated with *Leucus bicolor* (Girard)

D.  $9\frac{1}{2}$ ; A.  $10\frac{1}{2}$ ; head  $4-4\frac{1}{4}$ ; depth  $3\frac{3}{4}-4\frac{1}{4}$ ; teeth 2, 4—5 or 5, 2; scales 10-59-6.

Mouth oblique, jaws equal, maxillary reaching front of eye or somewhat farther in the largest specimen. Eye  $4-4\frac{1}{4}$  in head,  $1\frac{1}{2}$  in the interorbital space. Pectorals reaching ventrals in male, much shorter in female.

Color in alcohol; chocolate above, bordered on the sides by a darker stripe; a black band from tip of snout to base of middle caudal running along the lateral line in front and on the tail, above the lateral line along the abdominal region; a light band from upper angle of eye between this and the dark of the back. Sides below the dark lateral band silvery, more or less peppered with black or chocolate. Dorsal and caudal dusky. Anal and ventrals light. the rays chiefly dusky. Upper surface of pectorals dusky, the color becoming more intense toward the outer ray which is black; lower surface of pectorals white. All markings most intense on male.

FISHES OF ALLEN SPRINGS, LAKE COUNTY, CALIFORNIA.

A few specimens were collected by Mr. D. Cleveland, at Allen Springs, Lake County, California.

PTYCHOCHEILUS OREGONENSIS (Richardson.)

SALMO IRIDEUS (Gibbons.)

URANIDEA SEMISCABRA CENTROPLEURA var. nov.

Two specimens .072 and .08 m. long

Head  $3\frac{1}{2}$ ; depth  $4\frac{3}{4}$  D. VIII,  $17\frac{1}{2}$ ; A. 14; V. I, 4. Pectorals  $3-3\frac{1}{4}$  in length; ventrals 5; caudal 4.

Spinous dorsal pale at base and tip, the median region black. A band of prickles along the median line of the body to near pos-

terior margin of anal; the rest of the body without villi or prickles. Lateral line complete. Ventrals reaching  $\frac{2}{3}$ - $\frac{4}{5}$  to vent, which is nearer to base of caudal than to tip of snout, otherwise as in *semiscabra*.

THE YOUNG STAGES OF SOME SELACHIANS.

*SQUALUS ACANTHIAS* L. Captain Carter of the *Azalene* obtained the young of this species from its mother in August. They were far along in their development.

Total length .22 m; dimensions of the yolk. 02 x. 04 m. The upper surfaces are blue, the lower white; a series of white spots along the sides. A light streak on sides above the ventrals. Anterior portions of dorsals black, the posterior margin and tip white. Upper margin of caudal and anterior margin of its lower lobe white; tip of upper lobe black; a white and then a black band between the black tip of the upper lobe and the anterior margin of the lower lobe. Upper basal portion of ventals dark blue, the remainder of the fin white. Pectorals largely blue above, the posterior margin being white, their lower surfaces largely white a median blue spot on its outer half. Snout broad and rounded.

*TRIACIS SEMIFASCIATUS* Girard. A female of this species about 1.5 m. long, caught Sept. 6, 1889, contained a number of young measuring .095-.105 m. Each embryo is surrounded by a delicate membrane filled with a hyaline watery albumen. The yolk is pyriform and measures .03 x. 07 m. In the smallest individuals the external gills are still present; the spiracular gills have, however, disappeared. In the proportions, position of fin and coloration these embryos greatly resemble the adult. The asperities of the skin are entirely wanting. The ventral surface with the paired fins, the anal and lower lobe of the caudal are plain. A dark cross bar between the spiracles; three cross bars between this and the first dorsal fin, one on the middle of the first dorsal, another at its posterior margin, two between the dorsals, a dark cross bar on the anterior and posterior margins, of the second dorsal, four behind the second dorsal fin. In the larger specimens there is a spot on the middle of the lower caudal lobe and two or three along the sides anteriorly. The remaining color marks of the adult are not yet developed.

*RHINOTRIACIS HENLEI* Gill. A specimen of this species about 1.5 m. in length was caught off the wharf Sept. 7th, 1889. It contained six young, three in either uterus. They are .115 m. long and possess most of the characters of the adult. The tips of the caudal and dorsal fins and a median dorsal band behind the second dorsal are dark blue, otherwise the embryos are colorless. The external gills have disappeared. The umbilicus is very long .14 m. The yolk is bright yellow; it is intimately connected with the walls of the uterus. As the young of this species are attached by a placenta it may be generically distinguished *Triacis* from in which the young are free.

GALEORHINUS ZYOPTERUS Jordan and Gilbert. This species is common in San Diego Bay, but, as with most sharks it is most abundant in the latter part of Summer. Few males are caught; all the specimens examined by us were females. Two individuals taken August 30th, 1889, were with young which average .05 m. in the one, .08 m. in the other. The yolk is a large spheroid measuring .05 x .08 m., and, as in the case of *Triacis*, is surrounded with a loose, delicate membrane. The embryos are colorless. The position of the fins agrees with the adult. All the young, including the largest, have external gills still persisting at the gill openings and spiracles. The head is comparatively shorter and broader than in the adult and the eye much larger.

SCYLLIORHINUS VENTRIOSUS Garman. On January 19th, 1885, Mrs. E. D. Buell hatched a shark from a flat egg case which she gave to Rosa Smith. The shark may be said to have been "hatched" although the embryo had not absorbed the vitelline sac and it may have been not quite matured as Mrs. Buell pried open the case to let out the shark which was still alive. The shark was provisionally identified as *Scylliorhinus ventriosus* and the egg case sent to Mr. S. Garman to be figured.

The young shark differs from the description of the adult sharks in a few very prominent characters, i. e., the caudal is not continuous around the tail, the tip of the tail is margined by a series of flat spines and there is a series of rather strong spinelets along the sides of the back from in front of the second dorsal forward to the head. The central portion of the dorsal fins, the anal and the paired fins dark blue. Back and sides with dark blue double cross bars which are more or less interrupted, those of the tail extending upon both lobes of the caudal.

Length .085 m. Diam. of yolk about .02 m. Greatest depth .12 of total length; greatest width .14; length of head .17; width of head .18; length of snout .06; length of branchial area .09; width of mouth .14; distance from snout to first dorsal .49; length of base of first dorsal .07; length of caudal .26; length of pectoral .12; length of ventral .10.

*C. H. & R. S. Eigenmann.*

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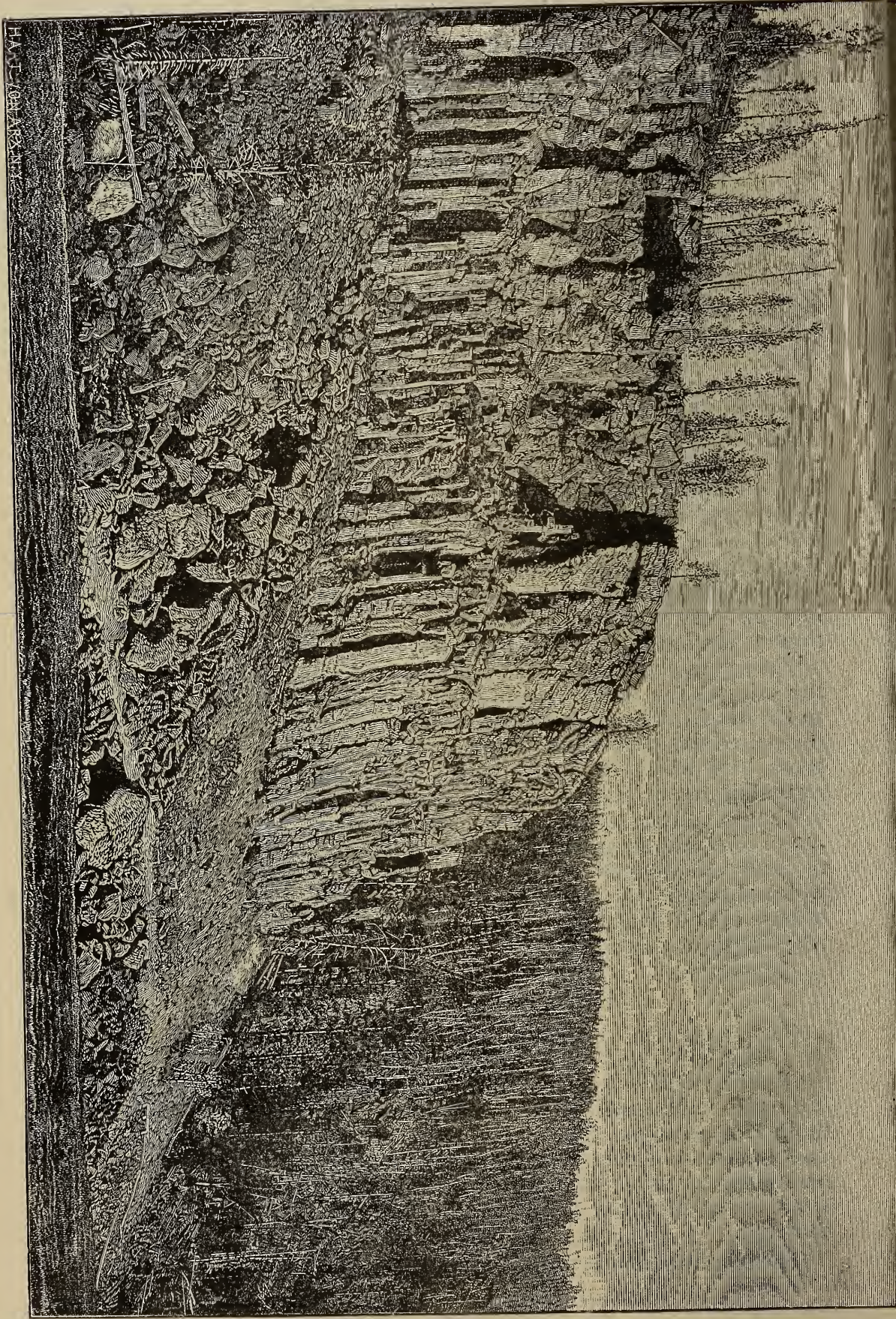
*OBSIDIAN CLIFF.\**

Obsidian Cliff is at the northern end of Beaver Lake, in the Yellowstone National Park, about eleven miles south of Mammoth Hot Springs. The cliff extends for half a mile, rising from one hundred and fifty to two hundred feet above Obsidian creek and falling away gradually to the north; the upper half is a vertical face of rock, the lower portion a talus slope of the same material.

The southern end is formed of nearly vertical columns of black

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\*) From the seventh annual report of the U. S. Geological Survey.



HAL  
1867



obsidian, or volcanic glass, which has resulted from the rapid cooling of a perfectly fused, igneous rock. From this, great blocks have fallen and accumulated at its base in a talus slope, over which has been built what is popularly known as the glass road, the material of which it is made, being as true a glass as any artificially produced. The colors and structure of this natural glass not only make it the most interesting rock the visitor will find, but the phenomena of its occurrence in this locality are of special scientific importance.

What was the original thickness of this lava sheet it is not possible to say. The dense glass or obsidian forming the lower portion is from seventy-five to one hundred feet thick; the porous and pumiceous upper portion has suffered more or less erosion, which was in part the result of ice action, the evidence of glaciation being more marked along the lower western slope of the plateau than on the top of it. The surface of the plateau is mostly pumice, with little, if any glacial debris scattered over it; but along the western slope the rock has been worn down to the massive obsidian, and the top of the cliff is covered with planed and striated glacial drift from a great variety of sources.

Half a mile southeast of Obsidian Cliff, on the plateau, about five hundred feet above the level of Beaver Lake, is a circular pit one hundred feet deep, the mouth of it being three hundred feet wide by three hundred and fifty feet long; its sides stand at an angle of thirty-five degrees and appear to be formed of pumiceous obsidian, the angular masses in the bottom being pumice. The rim of the pit does not rise above the level of the surrounding surface, and one comes upon it quite unexpectedly in the timber. The general appearance is that of a small crater which has been but slightly affected by glaciation.

In the Solfatara Creek valley, the lava flow is exposed in a cliff the lower portion of which is black and red obsidian.

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

(Compiled for the Colorado Biological Association.)

III ALGÆ.

The locality cannot be said to be rich in forms, although the irrigation ditches and creeks yield a certain number of species. Most of the species are of general distribution elsewhere. For identification we are greatly indebted to the Rev. F. Wolle, while one species was kindly named by Dr. W. G. Farlow.

1. *Conferva vulgaris*, Rab., near Ula.
2. *Cladophora glomerata*, Kg., well distributed; also found in Pueblo Co.
3. *Mesocarpus scalaris*, DeBy., near Ula.
4. *Hyalotheca disilliens*.
5. *Draparnaldia plumosa*, in Swift Creek, over 8,000 feet alt.

6. *Zygnema anomalum*.
7. *Spirogyra quinina*, Ag., near Short Creek, 8,200 feet;  
West Cliff.
8. *Spirogyra nitida*, West Cliff.
9. *Oscillaria froelichii*, Kutz.
10. " *gracillima*, Kg.
11. *Vaucheria geminata*, Short Creek.
12. " *dichotoma*, West Cliff.
13. *Nostoc sphæricum*.
14. " *interruptum*.
15. *Navicula viridis*, Kutz, near Ula.
16. " *rhomboides*, (Ehrenb), Greg, near Ula.
17. " *dactylus*, West Cliff.
18. *Nitzschia amphioxys*, Sm., near Ula.
19. *Epithemia turgida*, Sm., near Ula.
20. " *gibba*, Kutz, Short Creek, 8,200 feet alt.
21. *Synedra ulna*, Ehrenb., near Ula and Short Creek.
22. *Gomphonema acuminata*, Ehrb.
23. " *dichotomum*.
24. *Cocconeis pediculus*, common, and also found in Pueblo Co.
25. *Fragilaria capucina*, Sm., West Cliff and Short Creek.
26. *Diatoma (Odontidium) hiemale*, Kutz., Short Creek.
27. *Closterium acerosum*, Ehr., near Ula.
28. " *leibleinii*, Kutz.
29. " *cucumis*, Short Creek.
30. *Cosmarium nitidulum*, DeNot.
31. *Euastrum ansatum*, Ehr.

## IV. PTERIDOPHYTA.

1. *Botrychium lanceolatum*, Angst., Willow Creek, 8,200 feet (M. E. Cusack.) A syrphid larva, about 10 mill. long, pale, the dorsum dull orange, was found on this plant.
2. *Cryptogramme acrostichoides*, (Spreng.) R. Br., Porter and Coulter, Fl., S. Colorado.
3. *Woodsia oregana*, Eaton, Porter and Coulter, "Fl. Colorado."
4. *Pteris aquilina*, Linn., somewhat local at about 8,400 feet alt.
5. *Cystopteris fragilis*, Bernh., Porter and Coulter, "Fl. Colorado."
6. *Equisetum pratense*, Ehrh., West Cliff.
7. *Equisetum lævigatum*, Braun, Grape creek (Demetrio), Ellis and Everhart. This species has priority over *E. lævigatum*, Lesqx, fossil at Golden. The fossil species may be amended to *E. perlævigatum*, so as not to conflict with the recent one.
8. *Equisetum arvense* L, Willow creek and elsewhere. Some of the specimens are not typical.
9. *Equisetum hiemale*, L., Willow creek and elsewhere, common.

V—GYMNOSPERMÆ.

1. *Juniperus communis* L., abundant at 8,200 feet and upwards. The berries form part of the food of robins (*merula migratoria*).

2. *Picea engelmanni* (Parry) Eng., Short creek and Willow creek.

3. *Picea pungens*, Eng., Short Creek and Willow Creek.

4. *Pinus ponderosa* var. *scopulorum*, Eng., abundant, Short Creek, Willow Creek, etc.

*T. D. A. Cockerell.*

WEST CLIFF, October 7, 1889.

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*PRELIMINARY NOTES ON THE GEOLOGY OF  
THE ANACAPAS.*

(Read before the Santa Barbara Society of Natural History, August, 1889.)

The group of islands known as the Anacapas are more exclusively of volcanic origin than any other of the Channel Islands, the base from the exposure above the level of the ocean being composed of black vesicular basalt, capped in many places by a trachytic rock of a more recent lava flow, and at some points on the most elevated portions of the islands covered by a drift formation, among which are found jasper, chalcedony, and other fragmentary metamorphic rocks.

Where these metamorphic rocks are found there is abundant evidence that the aborigines, who inhabited the islands, frequented the place of deposit for the purpose of selecting rocks suitable for the manufacture of their arrow and spear points.

An unimportant deposit of limestone exists on the middle island, and a vein of chalcidonic quartz was found near the eastern end of the larger island; this was also used for the manufacture of weapons and knives.

Amygdaloides of chalcedony are very abundant, filling the almond-shaped cavities in the basalt.

An article on the geology of the Channel Islands, including the Anacapas, with geological sections, the result of the studies of the islands during the past twelve years, is being prepared, and will be presented to this society at its next meeting.

There are many things connected with the fauna and flora of these islands which are of much interest to students of natural history, and the scenery equals in variety and grandeur many of the most noted localities of other countries, a fact which our local artists are making known.

The land shells of the islands are peculiar; the only helicoid land shell found on the Anacapas, *Helix Ayresiana*, heretofore noted from San Miguel, Santa Rosa and Santa Cruz, is found but sparingly on the Anacapas, but the writer brought a few living specimens and planted a colony in the foothills of the Santa Ynez Range, back of El Montecito, where it is hoped they may

increase and furnish specimens of this beautiful snail for future generations of conchologists.

Owing to the steep and rugged shores, and a lack of suitable conditions, marine mollusks are not plentiful, except a few littoral species, which attach themselves to the rugged surface of the basalt rocks.

A list of the known mollusca of the islands is also in preparation.

We did not find any ferns upon the Anacapas, but, as adverse circumstances prevented our landing upon the western extremity of the group, where the conditions seem the most favorable for their growth, we cannot state positively that no ferns grow there. An article on the ferns of the Channel Island will shortly be published.

*Lorenzo G. Yates.*

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### BRIEFER ARTICLES.

(From Demorest's Monthly Magazine.)

EARLIEST AMERICANS.—The knowledge that America was inhabited by a highly civilized people many centuries before its occupancy by the race of red men which the earliest European settlers found here, is not new. Yet it was not until lately that actual records of information concerning this people were found, and for more than four hundred years all that we have known of them was gathered from a careful study of the relics of their greatness,—the ruins of their edifices, which have been found scattered over the entire western hemisphere. But the earthen tablets found in Peru, Central America, and Mexico, engraved on plastic clay in perfect Phœnician characters, and afterwards burned to render them imperishable, extend back nearly two thousand years before Christ. According to these records, these people, the Toltecs, came from some remote country and settled in South America. They were an eminently civilized and religious people, vesting the laws of their government and their theology in the same persons, and believing in one God, the creator and ruler of all, and in a mediator (Tzuma) who was to come to guide and teach them aright. Two distinct classes existed among them, the "Olptecs," or workers, and the "Orptecs," or thinkers, the latter including not only their priests and rulers, but their architects, artisans, engineers, and nobility. The "Olptecs" were serfs with no voice at all in the government or public affairs. These people rapidly increased, and by the year 400 B. C. had settled nearly the entire South American continent and spread over Mexico, where they found an aboriginal race dwelling on the banks of the streams and living upon the natural produce of the soil and upon fish and game. For over a thousand years the Toltecs occupied the land, until in the last century before Christ, the Aztec invaders sailed up the Amazon, claiming to have come from an Oriental country which they called "Aztlan." The Aztecs soon overruled the Toltec government, and in the course of two or three centuries the Aztecs were the dominant people.

Their supremacy lasted for seven centuries, and then, through luxurious abundance, their commerce and industries became less active and extensive, and their power commenced to wane. In 800 A. D. a savage horde from the north and west came down upon the Aztecs, and wiped out the primeval civilization in a savage war of extermination, lasting for years. The remnants of the stricken people fled to the mountains, where they became cliff and cave dwellers, and others became amalgamated with the destroying race, the Chicimecs. This is but a sketch of the wonderful history these long-hidden records relate. It was reserved for the progressive and enduring Indo-European branch of the Aryan race to open the pages and read for us the instructive history of these thirty forgotten centuries during which America was peopled in turn by the Hamitic branch of the Semite race, then by the Semites proper, and these finally exterminated by the fierce Turaneans from Chinese Tartary, until to-day nearly every vestige of their existence is being crushed out of the world's history by the rapid paces of an advancing civilization.

COMMUNISM IN OHIO.—In Tuscarawas county, Ohio, about eighty miles south of Cleveland, in a quaint little village called Zoar, is an obscure communistic colony of about three hundred inhabitants. It was founded in 1817, by two Germans, who selected this location, comprising some of the richest land in Ohio, and called their settlement Zoar, because it was to be to them a place of refuge from the world. The people, descendants of the pioneers who first settled there, are frugal and industrious, strongly attached to their beautiful home, and work for the community, which owns and controls not only the village proper but thousands of acres outside. The money is received into one common treasury, and the necessaries of life, including food and clothing, are furnished by the officials, consisting of three trustees and a committee of five, who are annually elected by ballot. They are Christians, accepting the Old and New Testaments, but they have no minister or ceremonies of any kind, and their place of worship is not called a church, but a 'congregation-house.' In marriage, the contracting parties procure a license, according to the laws of the State, and the marriages are solemnized by a Justice of the Peace, who is a member of the community. Years ago their rules were very strict, and the members all dressed alike; but now, although simplicity is the rule, they are not uniformly attired. They manufacture their own wool garments, and boots and shoes, and each family raises its own produce. If any need money for any reason, they make application for it. They run a flouring mill, two grist mills, two woolen mills, and a tannery. They have two good schools, and keep a large hotel accommodating many summer boarders. Altogether they are a happy, independent people, content to live apart from the world. Every person in the community knows his place, is assigned to his duty, and performs his work according to his ability. Nearly all the present members were born in

Zoar, although outsiders may join if they can pass satisfactorily the year's probation which is demanded. Yet this quiet, secluded life does not seem to accord with the desires of most men and women, although the Zoarites profess to be perfectly satisfied.

THE SALT MOUNTAINS OF THE COLORADO.—Upon a tributary of the Colorado River, the Virgin, are situated the salt mountains which are destined to be the source of great wealth to someone. They cover a stretch of about twenty-five miles on both sides of the Virgin River, seven miles up from the Colorado. The salt they contain is pure and white, and clearer than glass, and it is said that a piece of it seven or eight inches thick is sometimes clear enough to see through to read a newspaper. Over the salt is a layer of sandstone from two to eight feet thick, and when this is torn away the salt appears like a huge snowdrift. How deep it is has not yet been ascertained; but a single blast of giant powder will blow out tons of it. Under the cap-rock have been discovered charred wood and charcoal, and matting made of cedar bark, which the salt had preserved, evidently the camp belongings of prehistoric men. The rocks toward the salt mountains are painted and carved with hieroglyphics, the meaning of which is known only to the Mojave, Yuma, Piute and other Indians. From the reports of recent explorers it seems that there are stretches of hundreds of miles on the Colorado River as little known as the heart of Central Africa. The walls of the El Dorado Canyon, where the river is three hundred and fifty feet wide, are so high that neither the sun nor the moon can shine in. The Colorado is the greatest field for explorers on the North American Continent beside the Arctic regions, and the wonders yet to be unearthed there will probably much more richly reward the attention of the scientist than even the unknown spaces of the frigid North.

THE CABLE CIRCUIT OF AFRICA.—The report of the United States Vice-Consul to St. Paul de Loando, concerning the district of Mossamedes, on the West Coast of Africa, practically an unknown country to Americans, includes the important information that a cable has just been laid between the Cape of Good Hope and Mossamedes, touching at Port Nolluth, and continued from Mossamedes to Loando, completing the telegraphic circuit of Africa. It is expected, since the completion of this new line, that a message can be sent *via* the West Coast more expeditiously than by the old route to the Cape *via* the Red Sea and Zanzibar. The district of Mossamedes, of which a considerable portion of territory has been lately ceded by Portugal to Germany, is situated between  $13^{\circ} 50'$  and  $17^{\circ} 25'$  south latitude. The principal port and town is called Mossamedes. It has anchorage for any number of vessels, and good pier facilities. Its commerce chiefly consists of the exchange of cattle, dried and salted fish, dried beef, and agricultural products for goods and provisions that come from Europe. A line of railway from Mos-

samedes to two hundred miles into the interior has been projected. It will cross the Schella Mountains at a distance of one hundred and twenty miles from the coast, beyond which the country is said to be magnificent, and salubrious for Europeans, who are able to work in the fields.

MODERN CAVE-DWELLERS IN GERMANY.—Cave-dwellers in civilized Europe? It seems incredible; and yet, just above the thriving village of Langenstein, in the Hartz Mountains, and forming a part of it, are about ten dwellings hewn in the rocks. They are called the "Burg," or "castle," and here some forty persons have their home. In the face of the solid rock is to be seen a row of regular-shaped doors and windows, one door and one window belonging to each dwelling. The most ancient of these dwellings is the work of a young married couple whose extreme poverty gave them no other choice than to seek a home in the rugged mountain-side. Their work must be held deserving of respect, for it was no light task to pick away the rock bit by bit, as one workman must with no tool but his pick-ax. Through the doorway one enters a narrow, straight hallway, at the right of which another doorway leads into a good-sized room with a window, the only one in the dwelling. Opposite this doorway, at the left of the entry, is a shell-shaped hollow, which serves as a sleeping-room, in which, however, straw supplies the place of a bed. Back of this, at the left, is a store-room; opposite it, adjoining the living or sitting-room, is the kitchen, with fireplace and chimney; and back of the kitchen is another sleeping-room. The latter has no opening for light, yet, as the house-door is usually open the greater part of the year, there is light enough to see by. The walls are of the natural rock, and the apartments are perfectly dry, and not badly ventilated with the door, window, and chimney, which create a slight draft through the dwelling at all times. The place is warm in winter and cool in summer, and the inmates are rosy and healthy. Some of the cave-dwellers have whitewashed their houses, and made little gardens outside, so that the exterior does not display a forbidding appearance. At any rate, these cave-dwellings are quite as comfortable (and certainly more sanitary) habitations as the cellars of our cities, which are leased to wretched inmates, and are only caves of masonry.

A WONDERFUL LAKE.—'The 'Walled Lake,' as it is called, is the greatest wonder in the State of Iowa. It is situated in Wright county, twelve miles north of the Dubuque and Pacific Railway, and one hundred and fifty miles west of Dubuque City, and occupies a surface of two thousand eight hundred acres, with a depth of twenty-five feet in some places. The lake is from two to three feet higher than the earth's surface, and in some places the wall surrounding it, which gives it its name, is ten feet high. The stones used in its construction vary in weight from one hundred pounds to three tons, and the wall is fifteen feet wide

at the bottom and five feet wide on top. The mystery about the lake is that no one knows who built these massive walls that inclose it, or where the stone was obtained from, unless they were taken from the immediate vicinity; for surrounding the lake, to the extent of five or ten miles, there are no stones, although everywhere else in Wright county there are plenty of them. Another singular fact is that, although the water in the lake is always clear and fresh, no one has been able to ascertain where it comes from or where it goes.

AN ELECTRIC PLANT.—In the forests of India there has been discovered a very strange plant, which manifests a most astonishing magnetic power. Anyone who breaks a leaf from it receives immediately a shock equal to that which is produced by the conductor of an induction coil. A magnetic needle at a distance of twenty feet is affected by it, and near by becomes very much deranged. The intensity of this singular influence is very variable. It is most powerful about two o'clock in the afternoon, and almost without force at night or during rain. No bird or insect is ever seen to alight on the electric plant; some instinct seems to warn them of the danger of sudden death. None of the magnetic metals, iron, cobalt, or nickel, are found where this plant grows, so that the electric force undeniably belongs exclusively to the plant. The mysteries of light and heat, magnetism and electricity, make the leaf and blossom of this wonderful Indian plant a rare botanical problem.

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### PROCEEDINGS OF SCIENTIFIC SOCIETIES.

(San Diego Society of Natural History, October 4, 1889.)

The meeting was held at the residence of the Vice-President, Rev. B. F. McDaniel. Dr. C. H. Eigenmann made some remarks on his trip in the Azalene to the Cortez Banks, describing the embryology of the rock cods and the surf perches, both of which bring forth their young alive. The vice-president presented fine specimens of Indian relics from El Cajon valley, describing the locality whence they came. Tourmaline in quartz was scattered over the hillside and it was evident the Indians had mined there for flints for arrow heads.

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### BIBLIOGRAPHY.

MALVA ROTUNDIFOLIA. The occurrence of this imported weed in a pasture at Trinidad, Colorado, is announced in *Field and Farm*, September 21, 1889. It is exceedingly abundant in some localities in the East, as at Niagara Falls, but we had not definite news of it before in Colorado. T. D. A. C.

JOSEPH P. NUNN. The Fertility and Coloring of Birds' Eggs. *Science Gossip*, September, 1889, p. 204. Statistics are given of



various clutches of *Merula merula*, and the author concludes that "the greater the fertility, the darker the color of the eggs."

THE MAMMOTH NOT EXTINCT. In *Science Gossip*, September, 1889, p. 214, is quoted a clipping from the *Saturday Journal*, to the effect that the mammoth (*Elephas primigenius*) still exists in Alaska! A certain Mr. Fowler, it seems, has interviewed a man who killed two of them. But the public unkindly scoffs and makes mention of the horse marines!

DIORCHIDIUM TRACYI, DE TONI. *Journ. of Mycol.*, June, 1889, vol. 5, p. 95 and pl. x. Good figures are given of this species from New Mexico, which is the only North American species of its genus known. We confess, however, that we do not quite see on what grounds it is called *D. tracyi*, since it was apparently first described by Tracy and Galloway as *Puccinia vertisepta*, last year. The name ought surely to be *Diorchidium vertisepta*, (T. & G.), *vertisepta* not being preoccupied or otherwise inappropriate. Dr. De Toni's ideas of priority are, we hope, not those of most other mycologists. The same number of the *Jour. of mycol.* that contains the description of *P. vertisepta* has an article on *Doassansia* by him in which he proposes to alter *D. punctiformis* (Niessl, 1872) to *D. Niesslii*, De Toni, because an Australian species was named *D. punctiformis* by Winter in 1887, *D. punctiformis* Niessl not being at that time recognized as belonging to the genus! It is the Australian *D. punctiformis*, Wint., that must be changed—say to *D. Lythri*, as it was found on *Lythrum*.  
T. D. A. C.

R. K. MACADAM. North American Agarics. *J. of Mycol.*, June, 1889, p. 58. Descriptions and localities are given for 11 species of *Russula*, only three of which are quoted from anywhere on the Pacific Slope. There is probably a great deal yet to be done among the Western Agarics.  
T. D. A. C.

H. J. ELWES. Notes on genus *Erebia*. Trans. Entomological Society of London, 1889, p. 317. This very interesting paper deals with this genus of butterflies at considerable length, and gives a list of the species. There are also remarks on the geographical distribution of the genus, which number altogether 57 species. A new var. *brucei* of *E. epipsodea* is described from Colorado. It is smaller, without ocelli, and the red band is almost obsolete. It is possibly a distinct species. T. D. A. C.

D. W. COQUILLET. The Imported Australian Ladybird, (*Vedolia cardinalis*). *Insect Life*, Sept. 1889, p. 70. Of this article on the imported Australian Coccinellid, and the wonderful work it is doing in destroying that pest, the *Icerya*, in California, we need only say that it is of the greatest interest, and ought to be read by all who care for the welfare of agriculture on the Pacific Slope.  
T. D. A. C.

*EDITORIAL.*

The development of a system for the utilization of the arid lands of the west is one of the most promising of numerous projects now under consideration for the material improvement of the condition of mankind. Not only is the west interested in the numerous discussions and actions taken on this subject, but the whole nation is becoming awakened to the necessity of rendering this vast area capable of sustaining human life.

It has been estimated that within historic times some seven millions of square miles along the shores of the Mediterranean, once highly fertile, have been changed into worthless deserts, and for nearly 2,000 years the inhabitable portion of the earth has decreased at the average rate of 3,500 square miles. This has been produced by the direct agency of man, the evil being chiefly due to river floods caused almost exclusively by the destruction of land-protecting forests.

It is right that America should set the example of reclaiming desert lands and thus increase earth's capacity for supporting the human race. *Irrigation and tree-culture must go hand and hand in this work.*

The value of irrigation has been abundantly proved by the past experience of the human race and is to-day sufficiently demonstrated in Southern California to convince the most skeptic. Not only is irrigation recognized in the west as the solution of the arid lands question, but agricultural papers are already pointing out the desirability of the system for the eastern States, where it is much less vital and was long considered needless.

The necessity for tree-culture is equally imperative with irrigation, and the arid lands question will never be satisfactorily settled without the recognition of this principle in its solution. The men who advocate the construction of a vast system of storage reservoirs for irrigation purposes, refuse to recognize the value of mountain forests as natural storage reservoirs and distributors of the water supply, and hold that it would be just as well to destroy them entirely, are not the men needed in this exigency of our country. The system of irrigation proposed is well, but if left to their own devices in the latter respect, the country will have reason for regret. America can ill afford to ignore the experience of other nations in this respect and forestry should receive equal consideration with irrigation.

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*NOTES AND NEWS.*

An event anticipated in Plymouth for more than fifty years took place there on the 1st of August. It was the dedication of the

monument in honor of the Pilgrims, by the Masonic Grand Lodge which laid the corner-stone thirty years ago.

The four hundredth anniversary of the discovery of America by Columbus will be celebrated by a World's Fair in 1892. New York city is confident of being selected as a site for this great exposition, but Chicago and St. Louis are both rivals for this honor. St. Louis claims to be more centrally located than any other city of its size in the United States, and to possess a greater population and two and a half times as many miles of railroad within a radius of 500 miles, than either New York or Chicago.

Rev. M. J. Berkeley, a distinguished English cryptogamic botanist, is dead.

Prof. F. H. Knowlton is collecting fossil plants in Western New Mexico, Arizona and California, according to the *Botanical Gazette*.

Prof. E. L. Greene spent the summer months in an exploration of the forests of Colorado, Montana, Oregon, Washington and California.

Dr. George Vasey has returned to Washington, D. C., from his tour through the West.

There are about 100 species of mosquitoes in the world, occurring in all climes. Eight or ten species have been known to inhabit England for more than fifty years—in fact since they were first studied—and no new species have been recorded in Britain in that time. One well-known British species has been recorded from Mexico; though no tropical species has ever visited England

Dr. Field, a celebrated physician, is reported to have used nothing but common flour of sulphur, a teaspoonful mixed with the finger in a wineglassful of water, and given as a gargle, when diphtheria was raging a few years ago. In ten minutes the patient was out of danger, and he never lost a case of this disease. Sulphur destroys the fungus in man and beast. In extreme cases dry sulphur was blown down the throat through a quill, and sulphur burned in a shovel so that the patient could inhale it, when a gargle could not be used.

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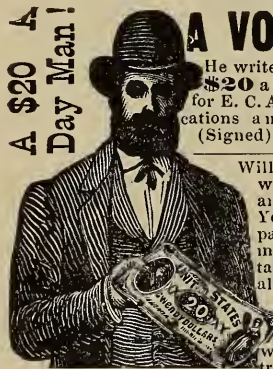
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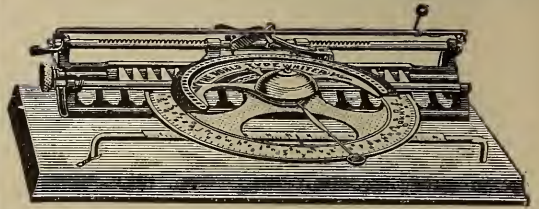


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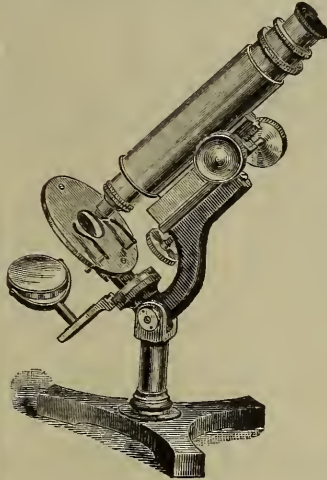
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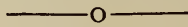
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