

On New Genera and Species of Californian Fishes—No. III.

BY J. G. COOPER, M. D.

MYXODES Cuvier, 1817.

M. elegans, Cooper, State Collection, No. 707. [Fig. 23.]

Specific characters.—Form elongated, high and narrow, the head wider than the thickest part of body. Length of snout equal to diameter of eye, lower jaw very slightly longest. Total length a little more than four and a half times that of head, which is equal to the greatest height of body. Head moderately arched, rounded above, the width between eyes a little less than the width of orbit. Orbit circular, contained four and a half times in length of head. Anterior lobe of dorsal commencing just behind head, triangular, one-twentieth of the length of fin, equal to the middle lobe in height; middle lobe gradually arched, its spines more slender than those of the first lobe; posterior lobe with soft rays only, about equal to the first, in size and form, extending nearly to the tail. Caudal fin quadrangular, its end obtusely truncate, nearly twice as long as wide. Anal commencing opposite seventeenth dorsal spine, nearly straight, its height one-fifth its length, and ending a little anterior to end of dorsal. Ventrals narrow, the middle ray longest. Pectorals arising opposite third dorsal spine, nearly as wide as long.

D. V—xxvii to xxx—8; C. 5—5; A. 26 to 28; V. 3; P. 11.

Scales in about 250 rows along middle of side, in $\frac{13}{50}$ — $\frac{18}{18}$ vertical rows along lateral line. Proportional measurements:

Length of largest specimen, 4 in	100.
Length of head20
Height of pectoral.....	.15
Length of dorsal.....	.72
Length of caudal.....	.12
Length of anal.....	.44
Height of ventral.....	.09
Height of body.....	.22
Width of body.....	.08

Colors.—Exceedingly variable, but the general pattern, as preserved in alcohol, consists of a series of vertical bands, alternating with spots of various shapes and sizes, and often densely mottled with dark and light blotches distributed regularly, but not describable. The fins have alternating bands, and in all the specimens the membrane between the third and fourth dorsal spine is as clear as glass, as if intended to be seen through, but probably shines in the water as a sort of signal. When fresh the colors of those from San Diego were as follows: 1st, dark brown, a purple lateral stripe, sides with dark and light brown bars, having silvery blotches between them; below yellowish, top and sides of head blotched with yellow, a bright red ring with a green centre near pectorals, and another near caudal. Dorsal with alternating bars of olive and yellow; pectoral yellow at base, its rays reddish, barred with purple, ventrals and anal smoky.

Another was striped and cross-barred with brown, and mingled with this

pattern were blotches of olive-brown, yellowish and purple, but no rings. Fins marked like the body, but paler.

It is possible that the rings observed in the first one, and not seen in any other, were caused by the growth of vegetable parasites, which are often found on fish of similar habits.

REMARKS.—This is the first instance of a *Myxodes* being found on our coast north of the equator, though a nearly allied genus, the *Heterostichus*, has been long known. I was in some doubt whether to refer the fish to *Myxodes* on account of the meagre descriptions of the genus accessible, but having sent a copy of the outline to Mr. Gill, I have been confirmed in the correctness of the diagnosis. The following are some of the most important generic characters not shown in the outline of our species :

Branchiæ VI–VI, the apertures freely connected below. Teeth uniserial in each jaw, those of lower jaw largest, some of those along sides larger than the rest. No teeth on vomer. Scales minute, entire, cycloid, closely adherent—none on head or fins.

The two-lobed form of the spinous dorsal does not apparently exist in some of the species. Suspecting that some of the other characters will be found sufficient to distinguish it, I propose for it provisionally the name GIBBONSIA, in honor of Dr. W. P. Gibbons, of Alameda County, whose descriptions of our viviparous fishes, published in 1854, by the Academy, have only of late been awarded the credit they deserve.

These beautiful little fish are found at low water in holes among rocks along our coast south of Point Conception, and at the adjoining islands. Their varied and elegant coloration would make them beautiful objects for a marine aquarium, but I had nothing suitable for the purpose, in which I could keep them alive long enough to study their habits.

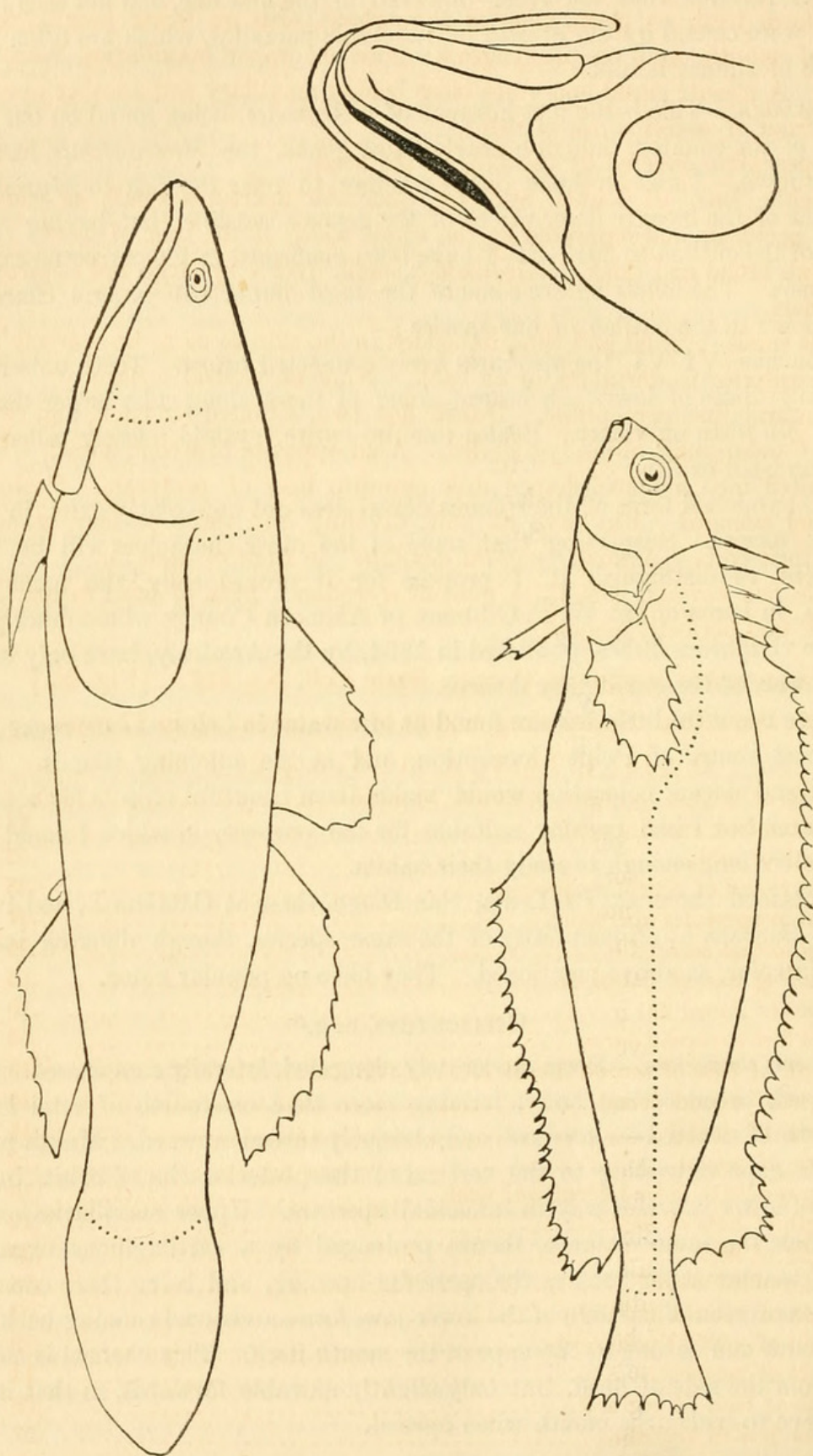
I obtained three at Pt. Loma, San Diego, three at Catalina I., and two at Santa Barbara I., all manifestly of the same species, though differing individually in color, as above mentioned. They have no popular name.

GILLICHTHYS, n. g.*

Generic characters.—Form moderately elongated, laterally compressed. Head depressed, broader than body, forming more than one-fourth of total length. Eyes small, situated far forward, and obliquely turned upward. Mouth moderate, its gape extending to the vertical of the posterior rim of orbit, but the angle of lower jaw half way to branchial aperture. Upper maxillaries extending back the same distance, thence prolonged by a cartilaginous expansion which reaches as far back as the opercular opening, and being there connected to an expansion of the skin of the lower jaw, forms a channel running back from the mouth and as long as the gape of the mouth itself. This channel is entirely free from the side of head, but only slightly movable forwards, so that it cannot serve to widen the mouth when opened.

* Named in honor of Mr. THEODORE GILL, of the Smithsonian Institution, Washington D. C., the author of various learned treatises on fishes; ICHTHYS, from the Greek for fish.

FIG. 18.



Premaxillaries not protractile, movable at their symphysis, and only half as long as maxillaries, with which they are connected by a thin membrane, ending below orbit.

Villiform teeth on premaxillaries throughout, also on lower maxillaries to angle of mouth, and on pharyngeals; none on upper maxillaries, vomer or palate. A minute nasal aperture close behind maxillary and another opening just in front of anterior rim of orbit.

Preoperculum covered by the skin of the head.

Branchiæ four, all double, and free, opercular apertures small, as wide as base of pectorals, and separated by the whole width of the base of head.

Tongue broad and thick. Air-bladder small, liver very large and alimentary canal short.

Scales small, cycloid and thin, imbedded in the skin so as to be scarcely perceptible anterior to dorsal fin, or on back. None on ventral surface.

No lateral line perceptible. Dorsal fins two, situated far back, and rather large. Caudal small, obtusely rounded. Anal opposite to second dorsal. Ventrals united into a funnel-shaped disk opposite base of pectorals. Pectorals large and rounded. Fin rays all soft, dividing into three or four branches toward their ends. A small "*papilla genitalis*" in front of anal fin.

Whole fish covered with thick mucous secretion. Skin of head rather loose and soft, and perfectly smooth.

GILLICHTHYS MIRABILIS Cooper, State Coll. No. 627. [Fig. 24.]

Specific characters. Scales along middle of side, about 90 in 27 rows.

D. 6-13; C. 13-13; A. 11; V. 6 + 6; P. 20.

Length of largest specimen obtained, $5\frac{1}{4}$ inches.....	100.
Distance from snout to orbit.....	.06
Length of orbit.....	.03
Snout to end of maxillary process.....	.26
Snout to opercular aperture.....	.27
Snout to first dorsal fin.....	.36
Length of base of dorsal fin.....	.15
Height of dorsal fin.....	.10
From first to second dorsal.....	.03
Length of base of second dorsal.....	.19
Height of second dorsal.....	.10
Length of caudal.....	.16
Width of caudal.....	.12
From caudal to second dorsal and anal.....	.10
Length of base of anal.....	.12
Height of anal.....	.06
From ventral to anal.....	.26
Height of ventral anteriorly.....	.02
Height of ventral posteriorly.....	.08
Height of pectoral.....	.14
Width of base of pectoral.....	.08
Lower jaw to ventrals.....	.27
Width of head between orbits.....	.02
Width of head at opercula.....	.15
Height of head at opercula.....	.16

Width of body at first dorsal.....	.12
Height of body at first dorsal.....	.18
Width of caudal at base.....	.02
Height of caudal at base.....	.09
Distance between ends of maxillary processes.....	.58

Colors.—When alive mottled with light and dark olive, paler below, sides of head reddish. In alcohol black, pale below, and scales below middle of sides finely punctate each with 8-10 dots, only visible under a microscope.

Hab.—I found these remarkable fish only in San Diego Bay, and in but one station, which was among seaweed growing on small stones at the wharf of Newtown the military post, in November, 1861. They were left by the receding of the tide, and must have been out of the water from three to six hours daily, though kept moist by the seaweed. The four obtained were all females containing large masses of ova, and may have come to the spot in order to deposit them.

I could not obtain a glass vessel suitable for an aquarium, so as to keep them alive and observe their habits. The use of the strange maxillary processes or channels is obscure, nothing analogous being known in other fishes, the nearest approach to them being apparently the lengthened maxillaries of some *Salmonidae* and *Clupeidae*, fish of entirely different habits and affinities, this one being evidently one of the *Gobidae*. The stomach contained small crabs, apparently swallowed whole.

PTEROPLATEA Müller and Henle, 1837.

P. marmorata, Cooper, State Collection, Species 674. [Fig. 25.]

Specific characters.—Outline of disk rhomboidal, the anterior borders forming an obtuse angle in front, nearly straight in their course to the lateral angles, which are sub-acute; the posterior borders rounded.

Ventrals small, oblong, obtuse-angled, projecting a little behind the disk. Tail nearly twice the length of ventrals, slender and pointed, flattened laterally behind the spine, and bordered by a very narrow membrane, commencing opposite the end of the spine below, and ending a little farther back above.

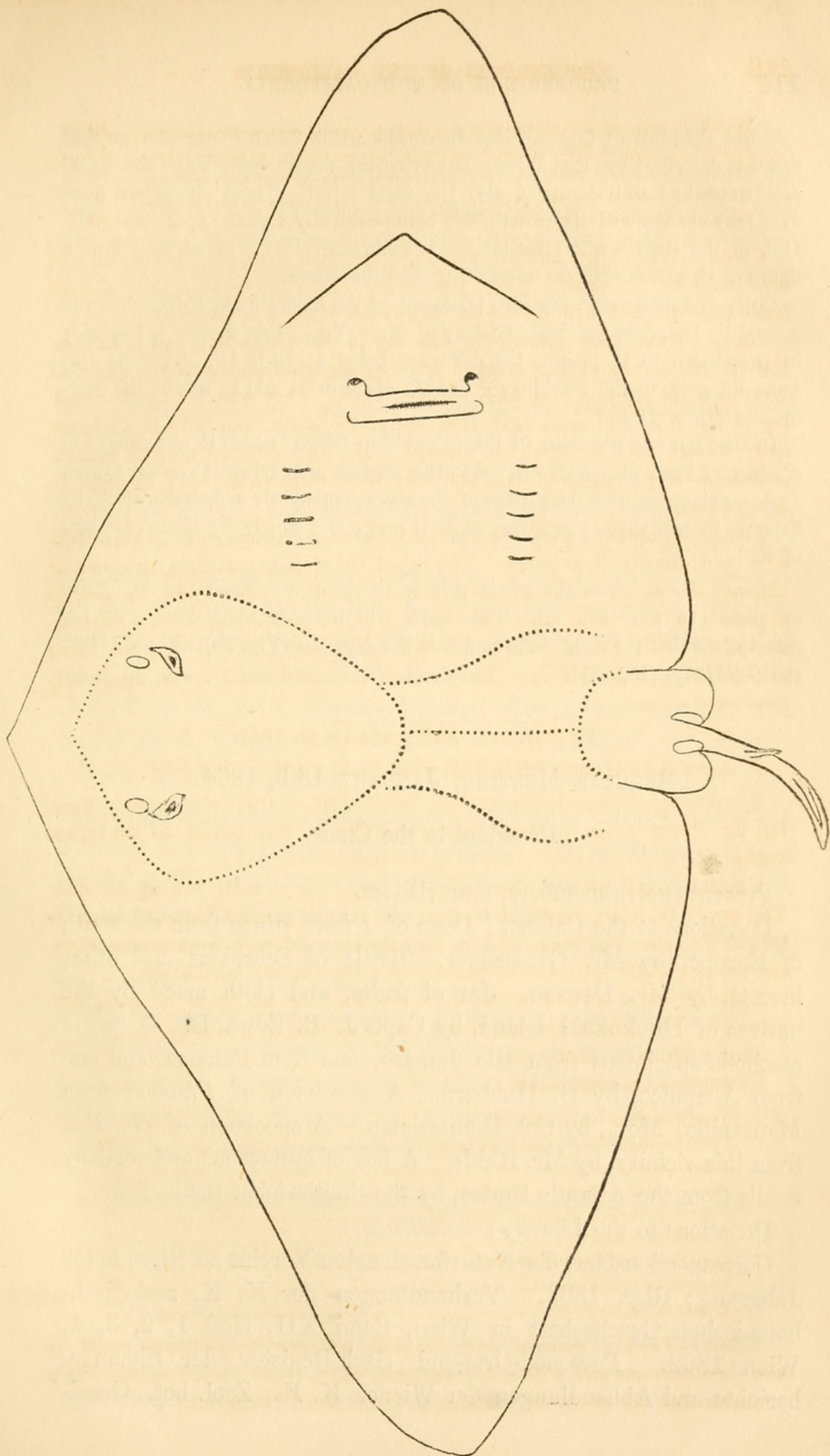
Spine arising at a point one-third the length of the tail from its base, one-sixteenth of its length, and less than a fourth as wide as it is long.

Both surfaces are nearly flat.

Proportional measurements:

Total length of specimen, $9\frac{1}{2}$ in.....	100.
From median line to tip of pectoral80
From anterior angle to eyes13
From anterior angle to ventrals.....	.70
Antero-posterior length of ventrals.....	.10
Length of claspers.....	.04
Length of tail beyond ventrals.....	.25
Length of caudal spine.....	.04
Distance between eyes.....	.15

Colors.—Thickly marbled with blackish and grayish mottlings equal in size; ventrals and tail with a few scattered white spots; below, white. It is probable that the colors are variable, as in the allied *Urolophus*.



I was doubtful at first whether to consider this fish a *Pteroplatea*, as that genus is described by Richardson as having the mouth curved, and the dental plate extending to its corners, also the teeth lobed. These characters, however, may change with its growth, this being evidently a young specimen. Mr. Gill, of the Smithsonian Institution, Washington, D. C., to whom I sent a figure of it, agrees with me in referring it to this genus.

Compared with the *P. Maclura* (Lesueur), of the Atlantic coast, described and figured by Dekay in the Nat. History of New York, this species is less wide in proportion to its length, the difference being as 10 to 16. There is also some difference in the markings. The *P. Maclura* is said to attain the enormous width of 18 feet.

I found but one specimen of this fish at San Diego, where it was caught in a seine. I have also seen one, when the steamer was lying at anchor, at San Pedro, swimming near the surface of the water, apparently supporting itself by flapping its wing-like expansions, while it progressed slowly by lateral motions of its tail.

NOTE.—By an oversight of the printer, the proper references to the figures on page 110 were left out. The reader will however understand from the descriptions that the right hand figure is the *Myxodes* (Fig. 23), and the others the *Gillichthys* (Fig. 24).

REGULAR MEETING, JANUARY 18th, 1864.

President in the Chair.

Present twelve members, four visitors.

Donations to the Cabinet: Cone of *Pinus pinea* from the south of Europe, by Mr. Grosseillier. Bottle of Scorpions and other insects, by Mr. Dawson. Jar of fruits, and cloth made by the natives of Hilukukaki Island, by Capt. J. B. Edwards: A jar of alcoholic specimens from Rio Janeiro, one from Panama, and one from Acapulco, by S. Hubbard. A specimen of *Phasma* from Manzanillo, Mex., by Col. Heintzelman. A specimen of *Gordius* from this vicinity, by Mr. Keith. A box of cretaceous and tertiary fossils from the Atlantic States, by the Smithsonian Institution.

Donations to the Library:

Correspondenzblatt des Naturforschenden Vereins zu Riga, 13ter Jahrgang; Riga 1863. Verhandlungen der K. K. zoologisch-botanischen Gesellschaft in Wien, Band XII, Heft 1, 2, 3, 4, Wien 1862. Personen-Orts-und Sach-Register der Sitzungsberichte und Abhandlungen der Wiener K. K., Zool. bot. Gesel-



Cooper, J. G. 1864. "On New Genera and Species of Californian Fishes— No. III." *Proceedings of the California Academy of Natural Sciences* 3, 108–114.

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