

A CATALINA WALKING FISH.
BY PROFESSOR C. F. HOLDER.

Among the many interesting fishes found in the Santa Catalina channel, California, and about the islands of the group of that name, is a member of the Pediculati, a giant of the tribe, differing materially from the small form common in the gulf weed of the Gulf of Mexico and vicinity. This singular creature has been observed but twice here, the specimen shown being found by the writer. The fish was about twelve inches in length and very bulky—a decided contrast to its small allies of the Atlantic. Its skin was rougher than that of a shark, covered with points, and was a rich yellow hue, dotted with spots of brown. The mouth was enormous, opening downward, giving the animal a very ludicrous appearance. Above the mouth was a projection, recalling the fin of the angler, and back of it another and larger, forming quite a lump. The eyes were small and dark, and the gills remarkable.

The peculiar character of the gills gives to this group its chief individuality. The gill openings are represented by a simple foramen, one on either side of the fish back of the base of the pectoral fin. In the ordinary fish the actinost bones are four in number, but here they are but two or three and very elongate, forming a pedicle to the pectoral fins, this giving the name Pediculati to the order. The fish is extremely sluggish, and has the faculty of moving along the bottom by a decided foot-like movement of its pectoral or side fins; hence the common name walking fish, though its walking powers are not so remarkable as might be supposed from the name.

The so-called legs or pectoral fins are well shown in the accompanying photograph and attract attention at once from even the layman. They seem to be thrown forward with a pronounced elbow, and to a limited extent these so-called legs can be used; the fish resting upon them, a position which raises its head and brings the oblique mouth in position to engulf any prey that may approach. The bunch of weed in front of the fish illustrates the size and appearance of the nest it builds for the protection of its eggs. In the Atlantic forms the nest is constructed of sargassum and floats at the surface, supported by the balloons or floats of the weed; but in this fish the nest is formed of weed at the bottom. The fish collects bits of weed and tendrils of kelp, which it winds roughly together and connects by a thread that resembles slime, but which has tenacity enough to hold the ball together. This cord is taken from a special pore in the ventral surface of the fish.

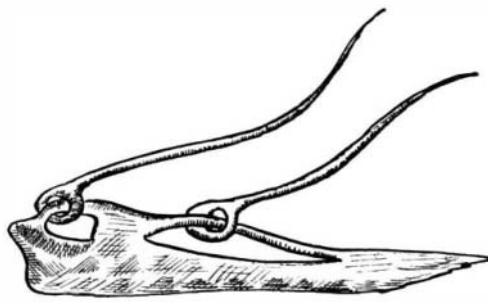
The fishes of this entire group are famous mimics. Many simulate the bottom and its rocks so perfectly that it is difficult to see them. All have a peculiar development of the dorsals. In the specimen shown the first dorsal is a curious short prominence, to some extent movable, with a pseudo barbel or bait upon its tip. Back of this is a larger and more prominent organ, which in default of better reason are called lures, and are supposed in some way to attract prey within reach of the oblique mouth. The writer has kept the walking fish of the Gulf of Mexico in confinement, but has never noticed any disposition to capture prey in this way. It is a sluggish fish, lying perfectly quiet for hours like the ordinary sculpin.

The most remarkable development of these fins is found in another family of the Pediculate fishes, the anglers or Lophidæ. The writer has also kept this fish in confinement and observed it carefully for days and weeks, hoping to prove or disprove the fishing story, which seems, like others of its kind, to be firmly entrenched in the public mind. A number of writers who are authorities make the statement that the fish does angle for its prey. T. S. Cobbold, lecturer on zoölogy in the Middlesex College, England, says that the fish "is provided with a pendulous flattened membrane, resembling a small flag; this can be hoisted at the animal's will, and while it calls the attention of little fishes in the neighborhood, at the same time serves as a bait, or, more strictly, a decoy. When about to take a meal, the body of the fishing-frog is carefully concealed by mud stirred up in the way already mentioned; and the bait being now elevated above the muddy zone, and shaken to and fro with a winning or 'killing' effect, the prey immediately gathers round; while no sooner have a sufficiently numerous group assembled—all being merrily engaged in tugging away at the decoy—than they are remorselessly and by one fell swoop consigned by the sea-devil into its capacious stomach. Surely this is a cogent illustration of final intention."

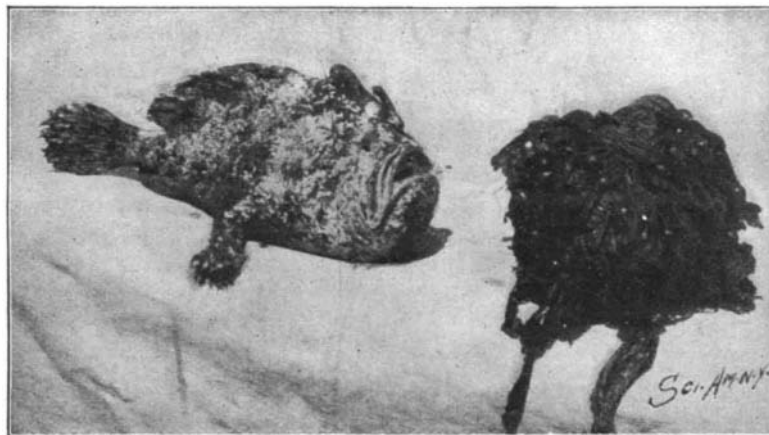
On the other hand, many authorities deny this, and no one professes to have seen the fish in the act of casting its deadly fly and bagging its game. In the specimen observed by the writer the fish presented a most remarkable appearance. To the layman it was invisible, even when lying amid rocks not three feet away. It weighed, perhaps, fifteen pounds, yet flat-

tened out, so mimicking a rock that only the most scrutinizing eyes could distinguish it. Not only did it mimic the rocks in color, but its shape and the peculiar barbels of flesh carried out the resemblance. From the lower jaw depended a mass of barbels which resembled seaweed; and the color tints of the body were perfect in their imitation of the surroundings. The foremost dorsal spines were very long, the first being at its tip—a leaflike filament of the prevailing color of the fish, the entire organ resembling a stalked weed (Laminaria).

How perfectly this ray or two of them could be used as a fishing rod can only be appreciated by a glance at the bone which the writer removed. The first ray is articulated at its base, like the links of a chain having a separate orifice; the second has a still larger moving space, and as can be seen, the ray can be moved backward until it lies almost flat upon the back of the fish; or it can be raised erect, or again bent forward so that the bait or supposed lure hangs directly in front of the mouth. In this position there is no doubt that it would, if waved gently, accidentally or purposely, attract the attention of small fishes, which, hovering over the mouth of the angler, would naturally be engulfed in the cavernous opening. The angler has a



ANATOMY OF DORSAL RAYS, OR "FISHING RODS," OF LOPHIUSO, SHOWING THEM THROWN BACKWARD.



WALKING FISH AND NEST.

rapacious appetite; it swallows large fishes, and has been known to devour sea birds.

One of the most interesting of the Pediculati is the batfish, so called from its supposed resemblance to a bat. It has the same peculiar pectoral fins which have been seen in the others mentioned, and which give the name of walking fishes to the group. Its body is covered with diminutive spines or barbels, which aid in its remarkable mimicry; and directly over the mouth projects a pointed, hornlike object, and in a pit below it is a singular appendage, supposed to be a lure, in reality the first dorsal. In specimens observed by the writer this appendage was of no special use; yet its curious appearance suggested that it had some office in the economy of nature.

The Malthé would be at once recognized as a walking fish, its "elbows" being very pronounced, the fin being at the end of a peculiar projection that has a superficial resemblance to a thigh. On the bottom the fish raises itself slightly, resting in front on the ventral fins, which represent the front legs, and behind in the anal, and the two enormous pectorals, which are apparently the hind legs; all in all, being one of the most bizarre forms of thesea. The fish is more sluggish than any of its allies previously described, lying on the bottom, not seeking its prey, but waiting for it to pass, then rushing at it violently after the manner of the sculpins.

New Cotton Mill in Mexico.

Consul Canada, of Vera Cruz, under date of May 18, 1899, transmits newspaper clippings describing a new cotton mill located in Orizaba, about 82 miles west from Vera Cruz, on the Mexican Railway, as follows:

The company interested in the new concern consists mainly of French capitalists. The capital is \$2,200,000.

Work on the building was commenced December 1, 1896. In the latter part of August, 1898, the first turbine wheel was installed.

The power is derived from a fall in the Rio Blanco—a height of 82 feet—5,000 liters per second. The water is stored up in a tank containing 1,200 cubic meters, moving two turbine wheels of 500 horse power each. From the turbine pit, 135 feet deep, the water flows through a tunnel 670 meters in length and is used again by the cotton factory at Nogales, another suburb of Orizaba.

The factory occupies an area of 170 square meters. The buildings are lit with 1,200 incandescent lamps and 20 arc lights. The company generates its own electricity.

In addition to the power derived from the turbine wheels, there is a magnificent steam engine of English make; capacity, 450 horse power. There are 8 Northrop American looms. The balance of the machinery, with the exception of the electrical plant, is English. The electrical part is French.

This factory is now the second largest in the republic, the largest being that at Nogales. This concern employs some 950 operatives—men, women, and children—but the help, so far, is almost entirely male, girls and women being scarce in the district.

Germans and Frenchmen are in charge of the printing. Six colors are printed simultaneously, with fine engrossed English cylinders. The capacity of the mill is 1,500 bolts a day.

The mills are turning out various grades of goods, from common manta to prints. At present they are not making a very high class of goods, but when the help gets more intelligent they will do so.

The Waste Paper Nuisance.

Owing to the great cheapness of paper, caused by the ever-increasing use of wood pulp in its manufacture, and owing to the fact that it is practically valueless after having served its original purpose, it is the cause of a nuisance very prevalent in large cities. The paper is thrown into the streets or in lots, and is blown about with every gust of wind and collects under stoops and in fence corners, where it is sometimes set afire by mischievous and thoughtlessurchins. It is readily conceded that waste paper is dirty and untidy, and, according to The New York Medical Journal, may, under some circumstances, act as a disseminator of disease. No effectual remedy for this has been devised, but that journal proposes to have ornamental iron urns swinging on trunnions, in which papers could be put and burned on the open-bottom grate. The object of having them swinging is to empty out stones and other incombustible matter. They might be put up in proper places and at convenient distances apart. As children like to play by making fires, it is likely that they will hunt for materials to gratify their inclinations in this respect.

The true solution of the waste paper problem is to pass stringent city ordinances, and see that they are enforced. In some cities it is an infraction of the sanitary code to throw papers in the street, and it is to be hoped that the regulations which exist will be enforced.

ONE of our correspondents, Mr. W. H. Smith, of Seward, Neb., sends us an interesting account of a remarkable stroke of lightning which killed five young men at one time. They were riding in a wagon with a team of horses, and they must all have been instantly killed, together with the horses. They were found the next morning by a farmer passing along the road.

The Current Supplement.

The current SUPPLEMENT, No. 1229, has a number of articles of great interest. The front page is taken up by a large engraving of the new statue of Benjamin Franklin, which has just been erected in front of the post office of Philadelphia. "Glue Testing" is an important technical article. "Magnetism Illustrated by Air Currents" describes interesting experiments. "The Operating Cost of Horse and Electric Delivery Wagons in New York City" is a very timely article. "Mapping the Mammoth Cave," by Dr. Horace C. Hovey, describes in an interesting manner the methods employed in determining the size and shape of the passages in the Mammoth Cave.

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