ART. XXII.—*On Eels.*

By E. O'H. CANAVAN.

[*Read before the Wellington Philosophical Society, 13th July, 1892.*]

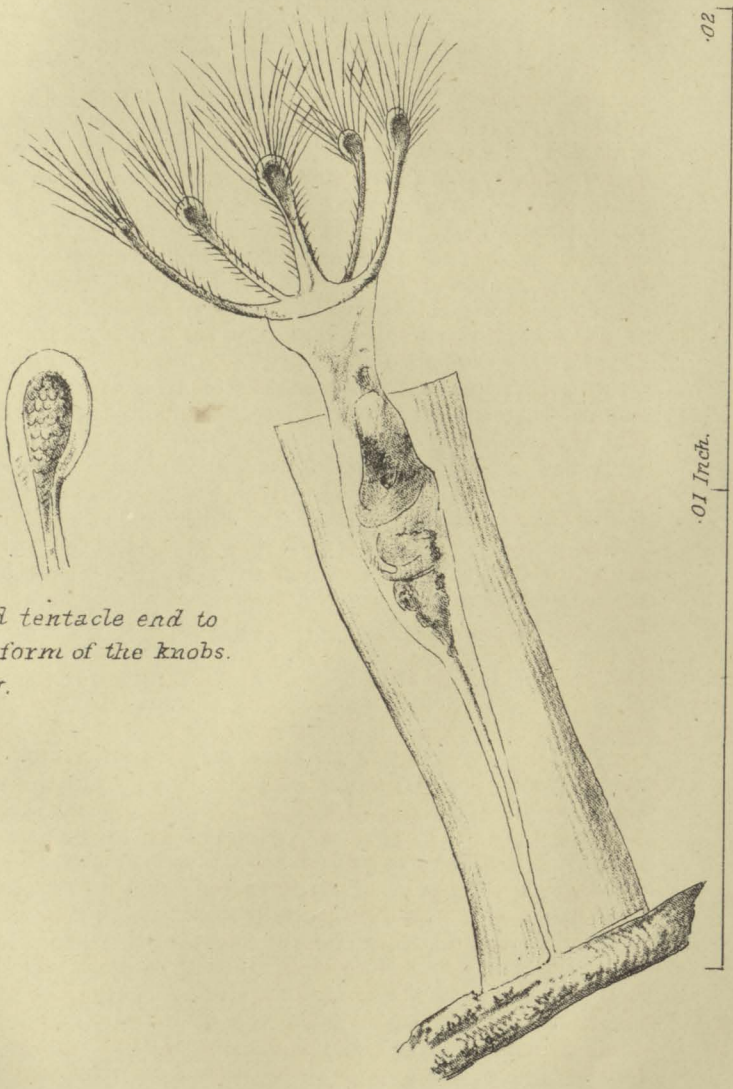
MORE than forty years ago a friend of mine asked me if I ever studied the habits of eels, or if I knew how they propagated their species. He further told me that it was worth any trouble I might take to study the subject. He afterwards gave me such advice as he thought would assist me. He was a gentleman who had travelled much, and who was very fond of hunting. He made some expeditions to North America, where he spent years hunting; and he wrote a book containing an account of them, which showed that he possessed a sound knowledge of natural history. This gentleman's name was Captain John Palliser, of Cummeru Lodge, County Waterford, who, I regret to say, has not lived to learn the results of the inquiry he then started.

My first step was to inquire among the old residents of the country, as I found that they had traditions which often lead an inquirer on the right path. But in this case I was disappointed. Some said that eels came from horse-hair; others said they came from the eggs of a fly; and others said they travelled over the land from one stream or pool of water to another. They all agreed on one point—viz., that, no matter where a hole deep enough to get filled by percolated water was made near any river or pool, that hole of water very soon became inhabited by eels. They even made use of this fact to prove their various assertions. I found that in various rivers of the country weirs were fixed, and that the eel-fishing was carried on during the late winter and early spring. These fisheries are very valuable, a rental of thousands of pounds being paid annually for the privilege of fishing at one weir. This was my first clue—viz., that at a certain season every year eels went in numbers down the rivers towards the tidal waters. I found that eels travel and feed at night, and that they sometimes travel in the dark waters of a flood. I found that in the latter end of the fishing-season eels contain a lining of fat on each side, lying just as the layers of ova lie in the oviparous fish. On inspecting this fat with a powerful glass I found it to be contained in minute cells, and that it very much resembled ova. I therefore, by the advice of Captain Palliser, had the fat of twelve eels treated in the same manner that the ova of trout and salmon are hatched; but at the end of three months I could render this fat into oil just as I could eel-fat not so experimented on. This con-

vinced me that I should look further to find their mode of propagation. About the year 1851, while salmon-fishing in the River Suir, near Clonmel, about the end of July and the beginning of August, I discovered eel-fry coming up the river in numbers, as whitebait come up other rivers. They were perfect in structure, but very small—small enough to run through any interstice that would admit a drop of water through it. This accounted for eels getting into the water-holes near rivers before alluded to. I followed these fry, and found them forming a deep narrow column along the right bank of the river, close to the edge, and extending for miles. Up every streamlet, no matter how small, a detachment from the main body made its way over every obstacle. It was very interesting to watch the little creatures struggle up the wet grass, stones, and weeds, as, no matter how often they were washed off, they renewed their efforts until they succeeded. For the succeeding four years I observed the eel-fry ascending this river at about the same time each year. In the north and west of Ireland, and in Scotland, I also observed eel-fry ascending rivers. In the rivers of the west of Ireland they are very numerous. The people there call them "luogues" (singular; pronounced "lū-ōg"), and they catch and use them for food, as we use whitebait, and a very good dish they make.

When in Collingwood, New Zealand, I observed eels coming down the river to the tidal waters. There was a fall in the river which terminated the tides (except spring-tides), and on this fall, in October and November, the boys, with gaff-hooks, used to catch eels coming down the fall; and in February and March they would catch eels going up. This proved that eels go up rivers after visiting the tidal waters; but I noted this also on the River Suir and a tributary of it called the Anner. In Porirua, New Zealand, I noticed that eel-fry went up the river in February and March. In 1890 mining speculations took me to Cullensville, and, as is my custom, I tried all the streams for the fresh-water pearl-mussel (*Unio aucklandicus*), which I found so abundant in the streams and lakes of West Wanganui and in the streams of Wanganui North. I did not discover any mussels, but on two occasions I found two eels entwined so that I was able to throw one pair out on the bank. They were too quick for me, and got back safely to the water before I could catch and examine them. Of course they became separated when I threw them out. In January, 1891, I, with others, was fishing in the stream near the Grove, in Queen Charlotte Sound, at night, and, having caught some eels, returned to camp, about nine miles inland. On cleaning the eels the following morning I found in one a bag or matrix, distinct from the alimentary

To illustrate Paper by Archd.n Stock.



Enlarged tentacle end to shew the form of the knobs. side view.

Floscularia coronetta.

canal; and in this matrix eleven small eels that had life enough to move about, although the mother was dead some hours. They had not yet arrived at maturity. The dorsal fin was visible, and so were the head and other parts, all of which appeared to be beneath a thin film. The head, one would say, was not perfect, although the shape was distinguishable. In January, 1892, I caught two of these female eels. The time was later in the month than when I caught the one the year previous, and the young ones were more perfect. These females were dead long before the other eels showed any distress from want of their native element.

What I have discovered I arrange as follows: *First*, that eels are night fish—*i.e.*, that they travel and feed at night. *Second*, that they go to the tidal waters (when practicable) to deposit their young. *Third*, that they bring forth their young alive in the tidal waters. *Fourth*, that they go up the rivers again, and so do their young ones.

Since I wrote the foregoing I have had a conversation with Mr. Henry Redwood, of Spring Creek, a good and keen observer of nature. He said that he had frequently observed the matrix that I have described, and found in it the young eels as I found them.

ART. XXIII. — *On a New Zealand Variety of* Floscularia coronetta, *Cubitt.*

By Archdeacon STOCK, B.A.

Communicated by W. M. Maskell.

Plate X.

[*Read before the Wellington Philosophical Society, 3rd August, 1892.*]

THE animalcule known as *Floscularia coronetta* is rare in England. It is worth recording that a *Floscularia* almost identical with the English form was found by me in water at the back of the Hutt Parsonage. The drawing (Plate X.) accurately represents the New Zealand form. The only differences between this and the English rotiferon is that the arms in my specimens are longer than those in Hudson's and Gosse's drawings, and the knob at the end of the arms is not circular, as in their drawings, but oval. The animal is rare here, as well as in England.
