114.—FISH AND MEDUSÆ.*

By A. OESTERBOL.

It is well known that certain fish and medusæ may be said to live together as good comrades, as several fish accompany the medusæ wherever they go, and seek shelter under their swimming-bell. Thus young cod frequently are found under large medusians, supposedly to seek protection from their enemies, which probably are scared by the swaying tentacles of the jelly-fish. The young of the mackerel likewise often seek shelter under large medusæ, and probably for the same reason. It is probable, however, that the young fish hide under the swimming-bell of the medusians, not only to escape the persecutions of their enemies, but also because this place of refuge affords them easier access to food. The young of fish live on microscopic animals, and this food they find in the eggs and larvæ of the medusæ when these have left the mother animal. A kind of herring, found on the coast of America, eats not only the eggs of the medusa, but nibbles at the medusa itself. It is said that mackerel, when fully grown, will follow the medusæ and eat diminutive crustaceans found on them. A species of mackerel which lives on the coast of Australia has a very sly way of seeking shelter and providing its food, as, under the swimming-bell of the medusæ, according to an observer, they are safe from their enemies, and without the least trouble are liberally furnished with the small animals which constitute their food, as the constant current produced by the medusæ carries many of these animals underneath their swimming-bells. It has also been observed that a medusa will occasionally snatch a fish, which therefore has to pay with its life for the protection which it and its comrades have enjoyed; and small sea-nettles have also been observed to eat fish-eggs.

In this connection it may be interesting to note the observations recently made by Dr. Hugo Eisig in the aquariums of the zoological station at Naples, as they throw considerable light on the remarkable relations existing between fish and medusæ.

He states that fish are frequently found under the swimming-bells of the largest two medusæ in the Bay of Naples, and that they are so inseparably connected with them that they are frequently caught with the medusæ. Even in the aquarium they continually swim round the medusians, and occasionally hide under their bells. For a long time Dr. Eisig was of the opinion that the fish accompany the medusæ only to seek shelter from danger under the swimming-bells, but further observations showed that they preyed on the medusæ. Among the companions of these medusæ Dr. Eisig observed three mackerel. A young

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mackerel, about 2 inches long, was one day placed in an aquarium with a medusa, whose swimming-bell measured about 5 inches in diameter. The next morning Eisig found that the medusa had lost all the points of its tentacles, for the fish had eaten them. Soon after that he had an opportunity to observe another fish in the act of nibbling at the medusa, so that there can be no doubt as to these facts. But that the fish did not choose this food, because there was lack of other suitable food, is indicated by the following: A larger fish, about 6 inches long, which for some time had been in a basin where there were no medusæ, took no food at all, and finally became so weak that it looked as if it was going to die. But after a medusa had been placed in the basin the languid fish became very lively, constantly swam round the medusa, and soon began to nibble at it.

Two circumstances are remarkable in this observation. In the first place these fish can sport about unharmed among the tentacles of sea-nettles which possess the power of stinging severely, while many other fish, and frequently such as are larger than those referred to, are found dead, hanging to the points of the tentacles. In the second place these fish are able to eat a substance which acts like poison on most other fish, or which is at least refused by them. Although the observations in most of the cases referred to above seem to indicate that the fish derives the principal advantage from this companionship, there is nevertheless something mysterious about this relation. It is very evident that it is an advantage to the fish to live in a place shunned by its enemies, and where it has free access to suitable food. But on the other hand it is very remarkable, and agrees but little with what is known of similar relations between other animals, that this companionship should be maintained unless it is an advantage to both parties. The most plausible explanation seems to be that the protection enjoyed by the fish is compensated by the fact that the medusa every now and then seizes and kills a fish. But what does the medusa gain by having a fish living inside its body, as has been observed in the Indian Ocean?

115.—NEW ENGLAND FISHERIES IN JULY, 1885.

By W. A. WILCOX.

If it was not for an unusually light demand and extremely low prices for all kinds of fish, the New England fisheries would be in a prosperous condition; as it is, although fish are plentiful, and vessels arrive from short trips with good fares, prices are so low that few vessels are more than paying expenses.

During the past month squid and herring have been abundant in the weirs along the Massachusetts coast, supplying the ground fishermen with plenty of good fresh bait.