

As indicated in Chapter VII., zoologists have until lately been unable to decide what species of fishes live along the bottom, and what species belong to the intermediate and surface waters. In recent years our knowledge has greatly increased. The "Valdivia" Expedition took no less than 151 species in pelagic fishing appliances.¹ Many of these have raised considerable interest on account of their curious shapes, especially the so-called "deep-sea fishes," which were supposed to live in the great depths of the ocean.

During the cruise of the "Michael Sars" probably about 10,000 specimens of pelagic fishes were taken, exclusive of the many larvæ and young stages. This abundant material has not yet been worked up, and complete lists, even of the adult fishes, are not available. Of the Scopelidæ (including the genus *Myctophum*), the genus *Melamphaës* and different Stomiidæ, only a limited number of species have been dealt with, many of the species being new, while the larvæ and young fish have as yet only been divided into certain groups. Nevertheless, the following list is of interest, as it indicates a great advance

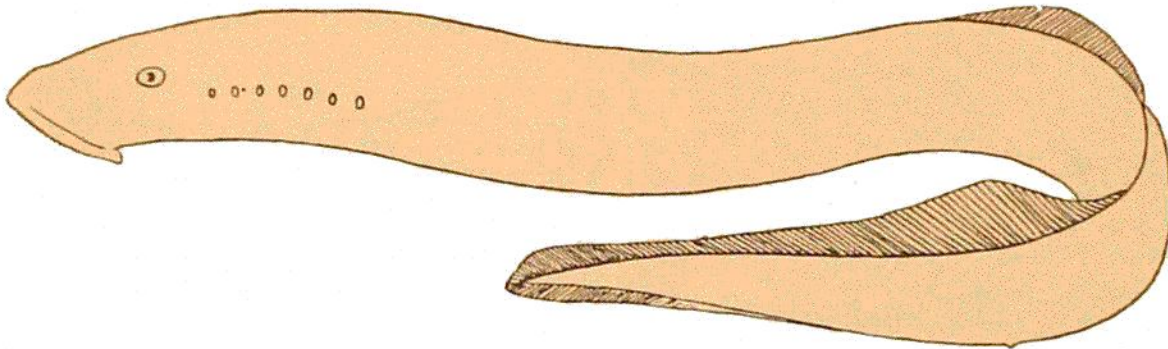


FIG. 449.
Petromyzon marinus, L. (From Goode and Bean.)

in our knowledge of the fishes of the North Atlantic; though the collections of the "Michael Sars" are deficient as regards the coastal and northern waters of the Atlantic, much information has been gained regarding the pelagic fishes of the Norwegian Sea and the North Sea.

The present list records 95 species, all, except one specimen of the lamprey, *Petromyzon marinus* (see Fig. 449), taken on the banks of Newfoundland, belonging to the Teleostei, or bony fishes.

The sub-order Malacopterygii comprises many of the most important forms from coastal waters as well as from the ocean.

The Clupeidæ (or herrings) are economically the most important of all pelagic fishes, and belong wholly or chiefly to the coast waters (neritic). In southern waters (Bay of Biscay, off the coasts of Spain, Portugal, and Africa) the principal species are the anchovy (*Engraulis encrasicolus*, see Fig. 450), *Clupea alosa*, and the sardine or pilchard (*Clupea pilchardus*, see Fig. 451), while in northern waters the herring (*Clupea harengus*) and the sprat (*Clupea sprattus*) predominate.

The Salmonidæ have many pelagic representatives. The light-coloured salmon and sea-trout are generally considered to be pelagic when away from the rivers and the coasts. The list of bottom-fish in

¹ Brauer, *Wiss. Ergeb. "Valdivia" Expedition*, Bd. 15, 1906.