

times, especially at night when safe from enemies, and again descending. It is quite uncertain to what depth they extend their range, and whether there is a zone of water intermediate between that near the bottom and that near the surface, which is devoid, or nearly devoid, of life, as is believed by Sir Wyville Thomson to be probably the case.

The trawl-net used on board the "Challenger" swept, in going down to the deep-sea bottom and in coming up, the entire depth of the sea, and animals were constantly being found in the net, about which it was quite uncertain as to what depth they came from. Amongst these were, for example, some *Medusæ*, which have been found by Prof. Haeckel to be of peculiar structure, and which may possibly be deep-sea forms; they may, however, have come from a few fathoms' depth only.

To settle this question a net of some kind is required which shall be capable of being sent down completely closed to any required depth, then opened and towed for some time, and then again closed before it is raised. It is by no means an easy matter to devise such a net which will be practically available. There are numbers of animals, fish, *Medusæ*, and *Actiniæ* for example, which are found in the deep-sea trawl, and about which it is a matter of speculation only as to the depth from which they came.

Mr. Murray hit upon the expedient of using the ordinary towing-net at considerable depths,* and with great success, since he constantly obtained large catches of pelagic animals, when very few were obtainable at the surface.

Pelagic animals are most widely spread, closely similar forms occurring in widely distant oceans. In this particular, the pelagic fauna resembles that of the deep sea. In the case of the sea surface winds and currents are present either to aid or limit the range of species, and the variety of climate acts as a barrier. In the deep sea all these forms of restriction are, however, absent.

The Deep Sea and its Fauna.—I have above briefly described the vegetation and fauna of the ocean surface, because, did these not exist, life would be impossible, or only extremely scanty, at the deep-sea bottom. Before referring to the fauna of the deep sea, it will be well to consider briefly the conditions under which it exists.

If a globe, 40 feet in diameter, be taken to represent the

* A. Baur was, I believe, the first to use the towing-net at considerable depths. "Beiträge zur Naturgeschichte der *Synapta digitata*." Verhandl. der K.L.C.D. Akad. 1864. Mr. Murray, however, invented the method independently.