

the mineral particles were very few and very small for a shore deposit; the mass of the mud was amorphous and clayey matter of a green-blue colour.

The various dredgings and trawlings were successful with one exception, when the line parted and a trawl with 1600 fathoms of line were lost. The number of animals was not large. From 2550 fathoms there were several siliceous Sponges and Annelids, and two specimens of *Brisinga*, along with some Shrimps and a Scopelid Fish (*Bathypterois longicauda*, Günther) which probably did not come from the bottom. In several trawlings in depths between 2000 and 2385 fathoms there were again several siliceous Sponges, a Holothurian (*Oneirophanta mutabilis*, Théel), *Hymenaster echinulatus*, Sladen, several Annelids and Hydroids, together with a few Fish and Crustaceans which probably came from intermediate depths. In depths less than 2000 fathoms animals were not much more abundant. The best haul was in 1825 fathoms, including the following:—*Ophiomusium lymani*, Wyv. Thomson; *Ophiotholia supplicans*, Lyman; *Cystechinus wyvillii*, A. Agassiz; and *Polystomidium patens*, Hertwig. In addition to the animals here mentioned there were of course at all the stations many Foraminifera living on the bottom—some attached to the nodules, some living in the mud, with either arenaceous or calcareous tests. There were many surface animals taken in the tow-nets during each day of the cruise, but the number of forms was much less than in the tropical waters.

By far the most interesting result of these trawlings and dredgings was the great number and variety of sharks' teeth, bones of Cetaceans, manganese nodules, volcanic lapilli, and zeolitic minerals procured in all the greater depths, especially towards the centre of the Pacific, all of which will be referred to in detail in subsequent chapters.

*Valparaiso to the Gulf of Peñas.*—The deposit at 1375 fathoms, 20 miles to the eastward of Juan Fernandez (see Chart 40), was a Globigerina Ooze containing 54 per cent. of carbonate of lime, which consisted of the shells of Foraminifera, a few fragments of Pteropods, Echinoderms, and Polyzoa. The mineral particles were chiefly of volcanic origin, and among them were very many fragments of palagonite.

The trawl contained over one hundred deep-sea animals, and fragments of palagonite, pumice, and tufa. The trawl appeared to have caught in something at the bottom, for the accumulators were stretched to their utmost before it was finally freed. When it came to the surface the net was not torn, but the beam was scored and marked with streaks of black manganese peroxide. The fragments of tufa in the trawl were coated with manganese on one side, and appeared to have been torn away from larger masses, so that here as well as at several other stations there were indications that the bed of the ocean was uneven, probably from volcanic disturbance.

At 1450 fathoms, 330 miles westward from Chiloe Island, the deposit was again a Globigerina Ooze containing 82 per cent. of carbonate of lime. The mineral particles were chiefly minute fragments of basic volcanic glass and palagonite, and peroxide of