

UNIVERSITY, EDINBURGH, *January 2, 1877.*

The special object of the CHALLENGER Exploring Expedition was to investigate the physical and biological conditions of the great ocean basins; and with this object in view, during an absence from England of three years and a half, and at intervals as nearly uniform as circumstances would permit, throughout a course of 68,890 miles, 362 observing stations were established.

The following list of these stations has been compiled for the use of those naturalists who have consented to assist in the working out of the scientific results of the expedition, with a view to their being published in an official account of the voyage. Interesting observations were made on land as opportunity occurred during the short periods of the CHALLENGER'S stay in port, and during her short visits to remote islands; but these observations were necessarily desultory and incomplete, and it has been decided to omit their consideration from the present work, and to publish such as may appear of sufficient value in the transactions of learned Societies. The official report will thus consist strictly of an account of the additions which have been made to the knowledge of the physical and biological conditions of the ocean by the expedition.

At each station the following observations were made, so far as circumstances would permit. The position of the station having been ascertained—

1. The exact depth was determined.
2. A sample of the bottom, averaging from 1 oz. to 1 lb. in weight, was recovered by means of the sounding instrument, which was provided with a tube and disengaging weights.
3. A sample of the bottom water was procured for physical and chemical examination.
4. The bottom temperature was determined by a registering thermometer.
5. At most stations a fair sample of the bottom fauna was procured by means of the dredge or trawl.
6. At most stations the fauna of the surface and of intermediate depths was examined by the use of the tow-net variously adjusted.
7. At most stations a series of temperature observations were made at different depths from the surface to the bottom.
8. At many stations samples of sea-water were obtained from different depths.
9. In all cases atmospheric and other meteorological conditions were carefully observed and noted.
10. The direction and rate of the surface current was determined.
11. At a few stations an attempt was made to ascertain the direction and rate of movement of water at different depths.

The numerical results of observations yielding such are now available in the logs, in the various reports to the Admiralty, and in the note-books and official journals of the Naval and Civilian Scientific Officers attached to the expedition.

The samples of the bottom procured by the sounding instrument were carefully preserved in tubes or in stoppered bottles, either dry or wet, with the addition of alcohol.

The samples of bottom and intermediate waters were determined as to their specific weight; in some samples the amount of carbonic acid, and in others the amount of chlorine, was determined; in others the contained gases were boiled out and sealed in tubes for future examination; and a large number of samples were reserved in stoppered bottles for analysis.

The mud and minerals and inorganic concretions brought up by the dredge or trawl were preserved in large quantity in boxes or jars for examination and analysis.

The collection of invertebrate animals is of great extent; and from most of the species being undescribed, and from the great peculiarity of the distribution of the fauna of the deep sea, it will perhaps yield the most generally interesting results.

The invertebrate animals from the deep-sea stations were, with few exceptions, placed in jars of rectified