

HISTORICAL INTRODUCTION.

A.—THE SCIENCE OF OCEANOGRAPHY.

Down till the early part of the present century the observation of marine phenomena was almost exclusively limited to the surface and sub-surface waters of the ocean. In the interests of navigation the hydrographer had undertaken a survey of coasts, an examination of oceanic routes useful for commerce, and a discussion of the winds, tides, and currents by which these were affected, but the observations of the biologist, the chemist, and geologist did not extend beyond the shallow water surrounding the dry land, nor deeper than a few fathoms. Our knowledge of the ocean was, literally speaking, superficial. No systematic attempts had been made to ascertain the physical and biological conditions of that vast region of the earth's surface occupied by the deeper waters of the ocean; the apparatus necessary for such investigations had not yet been invented.

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The desire to establish telegraphic communication between Europe and America gave the first direct impulse towards a systematic exploration of the deep sea. The improvement in methods and apparatus within recent years has been so rapid that it is now possible to examine the most profound depths of the ocean with great precision. The recognition of oceanography as a distinct branch of science may be said to date from the commencement of deep-sea researches.

The oceanographer takes account of everything relating to the ocean; his investigations deal with the form and divisions of all marine areas on the surface of the globe, the winds that blow over the surface waters, the contours of the ocean bed from the sea-level down to the greatest depths, the temperature, the circulation, the physical and chemical properties of sea-water, the currents, tides, waves, the composition and distribution of marine deposits, the nature and distribution of marine organisms at the surface, in the intermediate waters, and on the floor of the ocean, as well as the modifications brought about in living things by the conditions of their existence, the relations of man to the ocean in the development of fisheries, commerce, civilisation, navigation, hydrography, and maritime meteorology. All this vast assemblage of knowledge, which embraces some aspects of astronomy, geography, geology, physics, chemistry, and the biological sciences, makes up the modern science of oceanography.

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