

fishes of the Polar Sea. The sea between Hammerfest and Varanger Fjord, that extending towards Novaja Zemlja and Jan Mayen, and northwards to the north-western extremity of Spitzbergen, were explored. The greatest depth reached by the trawl was nearly 1400 fathoms. About thirty species were collected, of which those of the genera *Lycodes* and *Liparis*, and the genus *Rhodichthys* are of particular interest. In an elaborate Report by Robert Collett these fishes are described in detail and well figured.<sup>1</sup>

2. Thanks to the exertions of Professor A. Agassiz and Dr. Spencer Baird, the Government of the United States provided, at first by the loan of ships, and later through the organisation of the U.S. Commission of Fish and Fisheries, for a systematic exploration of the depths of the Western Atlantic. Omitting the earliest operations, in which no special attention was paid to deep-sea fishes, we have to mention, in the first place, the successful trips of the U.S. steamer "Blake," under the command of Lieut.-Com. C. D. Sigsbee and Commander J. N. Bartlett, in the years 1878 to 1880, to the Gulf of Mexico and the Caribbean Sea. The dredging and trawling apparatus used by the Challenger was improved, and in order to ascertain the nature of the fauna at any given depth intermediate between the surface and bottom, Commander Sigsbee introduced an apparatus, which works in a vertical, instead of horizontal, direction, and which admits animals only at a desired depth. Whatever importance may be attached to the results obtained by it with regard to the distribution of the lower animals, the fact that this apparatus failed to capture any fishes in mid-water is evidence of but negative value. The investigation of the bottom revealed areas devoid of and others rich in animal life, and the causes of such abundance or poverty were approximately ascertained. The operations of the U.S. Fish Commission had to be conducted chiefly with the direct object of developing the commercial resources of the country, but as this object goes hand in hand with, and as its attainment is in great measure dependent on, strictly scientific research, the work of the Commission was carried on in both directions. From the year 1877 the Commission was enabled, by the possession of a suitable steamer, the "Fish-Hawk," to engage in deep-sea operations, chiefly in parts of the Atlantic north of the area surveyed by the "Blake," but occasionally extending southwards into the West Indian Sea, as, for instance, those of 1884 by the U.S. steamer "Albatross." These explorations, which were systematically carried out with sound judgment and intimate knowledge of the requirements for deep-sea operations, yielded adequate results; no other part of the ocean is now better known, with regard to its marine products, than the Atlantic coasts of the United States and the deep water outside the littoral zone. The contributions to the fauna of deep-sea fishes were numerous and of great interest, and have been described chiefly by Messrs. Brown Goode and

<sup>1</sup> Den Norske Nordhavs-Expedition, Zoologie. Fiske. Christiania, 1880, 4°.