

carried on extensive explorations off the Atlantic sea-board of the United States at all depths, and for many years past the results have been given in the various publications issued from the office of the Commission at Washington.<sup>1</sup>

In the beginning of 1891 the "Albatross" took a series of observations off the Pacific coast of Central America, under the personal superintendence of Alexander Agassiz. Three trips were made from Panama, extending from February 22 till April 23, and 84 stations were occupied where the trawl, tangles, and tow-nets were used, and in addition 5 stations where surface and submarine tow-nets alone were in use. One of the special features of the expedition was the experiments with submarine tow-nets, which could be closed at any intermediate depth by means of a messenger sent down the line. From the results of these experiments, Agassiz concludes that "in the open sea, even when close to the land, the surface pelagic fauna does not descend beyond a depth of 200 fathoms, and that there is no intermediate pelagic fauna living between that depth and the bottom, and that even the free-swimming bottom species do not rise to any great distance, as we found no trace of anything within 60 fathoms from the bottom, where it had been fairly populated."<sup>2</sup> From his experience in the Gulf of California he thinks that "in a comparatively closed sea, at a small distance from the land, there may be a mixture of the surface species with the deep-sea bottom species."<sup>3</sup> The dredgings in the Panamic district showed that the deep-sea fauna was allied to that of the West Indies and the Atlantic Coast of North America. Mixed with the strictly deep-sea Panamic types were a number of forms the wide geographical distribution of which was already known. The richness of the Panamic deep-sea fauna does not compare with that of the West Indian side, or that off the eastern coast of the United States, and Agassiz believes that "this comparative poverty is due to the absence of a great oceanic current like the Gulf Stream, bringing with it on its surface a large amount of food which serves to supply the deep-sea fauna along its course."<sup>4</sup> In addition to the faunic observations already indicated, investigations were made on the topography of the bottom, the character of the bottom deposits, serial temperatures, specific gravity, and the colour of deep-sea types, while the Galapagos Islands were examined as regards their geology and fauna and flora.

The "Albatross" and the "Thetis" were subsequently engaged in running lines of soundings between the coast of California and the Hawaiian Islands, in connection with a proposed telegraphic cable between these places. The published results give an excellent idea of the relief of this portion of the Pacific sea-bed.<sup>5</sup>

The deep-sea soundings of the "Gettysburg" in the Atlantic in 1876, by the "Enterprise" in 1883-86,<sup>6</sup> in the Pacific and Indian Oceans, and the exploration of the

"ALBATROSS"  
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"ALBATROSS"  
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AGASSIZ.

<sup>1</sup> See Reports and Bulletins of the U.S. Fish Commission.

<sup>2</sup> *Bull. Mus. Comp. Zool.*, vol. xxi. p. 194, 1891.

<sup>3</sup> *Ibid.*, p. 199.

<sup>4</sup> *Ibid.*, p. 186.

<sup>5</sup> See Report on the Practicability of laying a telegraphic cable between the United States and the Hawaiian Islands, Government Printing Office, Washington, 1892.

<sup>6</sup> Barker, Deep-sea sounding on the U.S.S. "Enterprise" during 1883-1886.

(SUMMARY OF RESULTS CHALL. EXP.—1894.)