

## INTRODUCTION

This memoir is the third and final part of the general report on the oceanographic survey of the Gulf of Maine.<sup>1</sup>

Key charts to the stations will be found in the preceding part of this volume (Bigelow, 1926, figs. 1-9); the dates and positions are tabulated below (p. 976) with the physical data.

The chapter on hydrodynamics has been made possible by Lieut. Commander E. H. Smith's collaboration; R. Parmenter tabulated the physical data for the *Fish Hawk* cruises of 1925, collaborating also in the charts and discussion based thereon.

Records of temperature or salinity have been contributed by R. A. Goffin, Wm. C. Schroeder, Capt. G. W. Carlson, Capt. G. W. Greenleaf, C. G. Corliss, and Dr. C. J. Fish of the Bureau of Fisheries. Capt. John W. MacFarland, from his schooner *Victor*, and Henry Stetson and T. C. Graves, from their yachts, also have taken welcome observations.

I owe a debt of gratitude also to Dr. A. G. Huntsman, who has generously allowed quotation from his report on Canadian drift-bottle experiments in advance of publication, and who contributed other data acknowledged in the appropriate connections; to Dr. J. P. McMurrich, who has offered the use of his unpublished data on temperatures at St. Andrews, New Brunswick; and to the late Dr. A. G. Mayor, who contributed the colorimetric tubes used in the determination of alkalinity on the *Albatross* and *Halcyon* cruises of 1920-21.

## OCEANOGRAPHIC HISTORY

### 1. GULF OF MAINE PROPER

The first Gulf of Maine temperatures, so far as I can learn, were taken in October, 1789, by Benjamin Franklin's nephew, Jonathan Williams, who read the "heat of the air and water at sunrise, noon, and sunset" (1793, p. 83) on a voyage from Boston to Virginia, and found the surface 8.9° C. (18° F.) off the mouth of Massachusetts Bay on October 11, warming to 11.1° (52° F.) off Chatham on Cape Cod, to 15° (59° F.) over the outer part of the continental shelf south of Nantucket, and to 18.3°-19.4° (65° to 67° F.) in the inner edge of the Gulf Stream outside the edge of the continent on the 13th—readings that agree very well with the usual distribution of temperature for that season. On another voyage (from Halifax to New York) during the last week of July, 1790, he again took temperatures on Roseway Bank, Browns Bank, and in the gully between them; also along the southern side of Georges Bank (53° to 64° F.).

Enough readings of the surface temperature of the Gulf of Maine had accumulated during the first half of the nineteenth century to permit Maury (1855 and 1858) to show its coastal belt and the Bay of Fundy as between 50° and 60°, its southern side out to the continental edge as between 60° and 70° in July, and the entire gulf as colder than 50° in March.<sup>2</sup>

<sup>1</sup> The first part was devoted to the fishes (Bigelow and Welsh, 1925); the second to the plankton (Bigelow, 1926).  
<sup>2</sup> Petermann (1870) more correctly interprets the individual readings reproduced on Maury's (1852) thermal chart by showing the inner parts of the Gulf of Maine as 54.5° to 59° and the Georges Bank-Nantucket Shoals region as about 59° to 65.5° in July; about 32° and 32° to 41°, respectively, in January.