

of and adjacent to Mt. Desert Island. The major portion of the work was devoted to studies of the marine plant plankton in cooperation with several other investigators working together upon the problem of the production of life in the sea. However, gatherings of fresh water plankton were made and identified from all the lakes of Mt. Desert Island.

For purposes of identification samples were obtained with a no. 20 silk tow net at regular intervals throughout the summer from several selected stations in Frenchman's Bay and once from a series of stations in Penobscot Bay. Quantitative methods were also employed regularly to obtain data upon the volume of plankton production. Such samples were collected by two methods: 1) straining through a no. 20 silk net a measured volume of water obtained from various depths with a rubber hose and gasoline pump; and, 2) centrifuging a small volume of water to recover those tiny organisms which may have been lost through the meshes of the net. A part of each quantitative sample of plankton was dried and ashed for the purpose of obtaining the organic weight, and another fraction was used for identification and counting of the microscopic algae and diatoms by means of the standard method.

The summer's work will yield both qualitative and quantitative data concerning seasonal variation, vertical distribution and tidal fluctuation of the marine phytoplankton, and a taxonomic list of species found in the freshwater lakes of Mt. Desert Island.

7. ZOOPLANKTON INVESTIGATIONS

By CHARLES J. FISH, *Buffalo Museum of Science*

Zooplankton observations were made at selected localities throughout the season, special attention being given to two stations, one near Googins Ledge and one in the channel between Iron Bound Island and Long Porcupine Island. The latter station lies in the largest channel formed by the group of islands separating the inner and outer parts of the Bay. In order to get conditions typical of the inner area as a whole, this station was visited so far as possible on the last quarter of the ebb tide. In all sixty-two series of quantitative and qualitative determinations were made.

As the Sullivan River forms the principal source of river drainage into Frenchman Bay, observations were made along its entire course and into the tributary streams. It was found that during the past summer the importance of this river as a contributing factor to the fertility of the Bay was negligible. Even the head waters were populated by a marine neritic community and, except for the turbid brown color of the brackish water, little evidence of outwash could be detected. Over most of the river typical marine conditions prevailed. A haul

made in one of the tributary streams several hundred yards beyond and considerably above the level of the inland limit of tidal influence yielded plankton made up of a mixture of fresh and salt water species. The marine species must have been carried in during unusually high tides and survived after the return of the fresh water conditions.

The zooplankton life of the Bay itself consisted of two communities, a typical boreal neritic summer group, and a cold water community (*Calanus-Thysanoessa*) characteristic of the open Gulf at all seasons. The former, during the day, extended from the surface to about 45-50 meters, some forms such as the Cladocera and pelagic eggs remaining always at or near the surface. The bulk of the species, however, were concentrated near their lower level. Below 50 meters and quite distinct, the *Calanus* community was found everywhere in the Bay when the water was of sufficient depth. It was not possible to make sufficient evening hauls to determine definitely the extent of vertical migration at night, but sufficient catches were made to indicate that a part at least of the deep water forms join the upper community in the surface layers after dark. Some evening net collections contained as much as 85.3 per cent. of lower level species.

A striking characteristic of the neritic plankton of Frenchman Bay, both in 1929 and 1930, was the comparatively small number of species of invertebrate and vertebrate larvae taken by the nets, and the extent of the breeding season. Contrasted with areas to the west, such as Woods Hole, where during the summer the plankton contains a large variety of larval forms with very limited seasonal duration, Frenchman's Bay yielded a very small number of species, almost all of which were found at the beginning of the season (June 24) and occurred continuously throughout the duration of the observations.

Another apparent feature of the locality is the failure of many invertebrate and some vertebrate species to survive long after birth, if in fact they hatch at all. For some reason, perhaps temperature, development does not seem to be successful. It would appear that the waters must be stocked by immigration of adults from other areas.

Such a condition has been reported from the Bay of Fundy but was not believed to exist as far west as Mt. Desert Island. Next season an attempt will be made to determine the western limit of this zone. There is some evidence that Mt. Desert Island may form the western boundary and that in Blue Hill Bay more favorable conditions exist.

8. THE COPEPODS OF THE MOUNT DESERT ISLAND REGION

By CHAS. B. WILSON, *Westfield Normal School*

This abstract of the work upon copepods in connection with the oceanological survey of the region around Mount Desert Island, which