

The Foraminifera of the Canadian Arctic Expedition, 1913-18.

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(With one plate.)

The bottom samples collected by the Canadian Arctic Expedition by Mr. Frits Johansen were sent to me for examination and report. The area covered by the material is an interesting one, from which practically no records of foraminifera are available. The actual amount of material sent me was very small indeed, but careful searching has given a number of species. Most of these are of service in checking the work of Awerinzew on the Siberian Arctic, and of Kiaer on the American and European Arctic. In this way it rounds out the circumpolar distribution of certain species, such as *Hyperammina subnodosa*, which was not found by Kiaer in the American Arctic, but which is abundant north of Siberia. The Canadian Arctic material has this species as its most abundant form.

The whole assemblage seems to call renewed attention to the fact that many species of foraminifera are limited in their distribution to conditions of temperature, especially certain species, such as *Polystomella arctica*, are limited to the circumpolar area, with certain localized extensions southward. Others, while abundant in the Arctic, are now found in the Antarctic, and in the deep cold waters of the ocean basins between, a distribution known from other invertebrate groups as well.

Other species apparently of world-wide distribution have wide differences in different areas and, when a considerable series is available for study, it will probably be found that several distinct species or varieties have been included under one name. The tendency has been too much to ignore the various differences developed, and to place under one name different things from widely separated areas. Again, there has been a tendency to broaden the original characters of a species until it may now take in a wide range of forms, the real relations of which are obscured by such a method. Where a species is represented by abundant specimens, the striking thing is always the great uniformity rather than the wide variation which might be expected, but which does not occur. Most of the variability can be directly traced to different stages in the life-history, either developmental characters, or to the alternation of generations where both microspheric and megaspheric forms occur. With these taken into consideration, the amount of variation will usually be found to be surprisingly small.

If real progress is to be made in solving the distributional problems of our foraminiferal fauna, a close study must be made of differences wherever they occur. Such a study will undoubtedly lead to a greater refinement in systematic work on the group.

STATIONS FROM WHICH MATERIAL WAS EXAMINED WITH SPECIES OF FORAMINIFERA AT EACH STATION.

- 13l. Bering Sea, Alaska. 54° 24' N.; 160° 55' W.; 57 fathoms. July 1, 1913. A small amount of rounded sand grains, no foraminifera.
16d. Bering Sea, Alaska. 59° 17' N.; 165° 39' W.; 13 fathoms. July 5, 1913. A small amount of rounded sand grains, no foraminifera.
16f. Bering Sea, Alaska. 59° 34' N.; 167° 48' W.; 13 fathoms. July 5, 1913. A small amount of fine rounded sand grains, no foraminifera.
16g. Same station as preceding, no foraminifera.
20 b-c. Grantley harbour (Port Clarence), Alaska; 2-3 fathoms. July 30,