

Bering strait, while the wider channel between Greenland and Spitsbergen serves mainly for a southward moving outflow. The Antarctic, on the other hand, has no such barriers interposed between it and the rest of the watery world. If one consults a chart of the great sea currents it will be readily seen how free is the interchange between the Antarctic sea and the vast ocean areas of the world, and how restricted the interchange between these and the waters of the Arctic. Now, it is at least possible that the narrowness of these waterways linking the Arctic with the rest of the world constitutes a barrier to the introduction of new forms of marine life from other regions, among which new forms there might well be now and then species adaptable to the rigorous life conditions of polar waters and which would thus add to the richness of its local flora and fauna. For such introductions, multiplied and continued through long ages, would have no inconsiderable influence in this respect. And as the Antarctic sea does lie open to such importations, it is not to be wondered at that we find there, as we do find, a much richer diversity of diatoms, some of them perhaps locally evolved and some immigrants from other regions.

It would be a mistake to conclude from the foregoing that diatoms find an uncongenial home in the Arctic region. Although simplicity of structure and low number of species are characteristic of that locality the diatoms that do grow there flourish amazingly; so that in the matter of quantity few regions are as prolific of diatoms as the Arctic. Dr. Nansen and other explorers of the North Polar seas have recorded the unusually rich dredgings of diatom ooze secured there. The species adapted to a life in those frigid waters, with their long winters of night, are indeed few; but the fecundity of those that do grow there probably surpasses anything to be found in temperate or tropical regions. And in this respect any difference between Arctic and Antarctic diatoms wholly disappears; for in the Antarctic also the richness of the diatom ooze is startling and will impress anyone familiar only with material coming from temperate or tropical waters. This fact is deserving of the attention of all ecologists, because it is closely linked with the abundance of animal life inhabiting the northern and southern polar seas.

There will be found following each species in the list of diatoms here recorded one or more references to diatom literature. These have been so selected as to give the best descriptions and especially the best illustrations of the species in question; or in a few instances they refer to some figure which most accurately depicts that particular variation from the type form which is the one here recovered. This selection of references is necessary in fixing the forms here recorded because many figures in diatom publications are misnamed or, even more important, are so minute or so unreal in their markings as to be worthless. This is particularly true of illustrations made by early diatomists, to whom a sketchy suggestion of the diatom they were recording seemed to be quite satisfactory if it distinguished it from the comparatively few forms then known to the science. In consequence we find that to-day many of the figures and descriptions in these old works have become utterly valueless for purposes of identification, as for example, Ehrenberg, Agardh, Kützing, Nitzsch, etc. However, out of the most of these old named forms there have grown up quite definite concepts, the modern idea of the species; and it is to these later, sharply distinctive illustrations and descriptions that reference is here made.

In publications more modern than the foregoing we find much deplorable confusion introduced into diatom taxonomy because some authors have, on the one hand, assigned to the same species wholly different diatoms, or, on the other hand, have given new names to species already fixed. This has come about partly through carelessness but chiefly because of the rarity of so many important diatom publications. As the writer enjoys the advantage of being able to consult practically every work of value on this subject it seems worth while to correct in this paper some of these blunders by referring the reader, as above stated,