ARCTIC AND SUBARCTIC MARINE ECOLOGY: IMMEDIATE PROBLEMS*

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THE study of marine biology in the north has been pursued, in the past, mainly by the Scandinavian countries. In the northern waters which Scandinavian biologists do not normally visit, and especially in the North American Arctic, marine investigation is in its infancy, and has even lagged behind terrestrial ecology in the same area. As there are now signs that this condition is to be put back in balance, this is the proper time to review briefly the most interesting results of the past and to point out the most promising fields of study for the immediate future.

For the purposes of this paper the terms "arctic" and "subarctic", applied to the marine environment only, are used as defined previously (Dunbar, 1951a): the marine arctic being formed of those areas in which unmixed water of polar origin (from the upper layers of the Arctic Ocean) is found in the surface layers (200–300 metres at least). Admixture of water of terrigenous origin is ignored in this definition. The marine subarctic is defined as those marine areas where the upper water layers are of mixed polar and non-polar origin. By far the greater part of the marine subarctic lies on the Atlantic side, extending from the Scotian shelf and Hudson Strait to the Barents and Kara seas, and including almost the whole coast of west Greenland, the waters around Newfoundland and Iceland, much of the Norwegian Sea, and the waters off the west coast of Spitsbergen. The southern boundary of the marine subarctic is the limit of southward penetration of the arctic water; clearly it varies seasonally and with the state of the climatic cycle. For the large and rather ill-defined marine region south of the subarctic, the term "boreal" is used here, but with that region we are not directly concerned. It should be added that the division employed here apparently applies less to sessile animals and plants, than to the plankton and nekton, because of local variations in summer. This does not disturb the general picture, and is discussed further below.

Production

The fact that this division between the marine arctic and subarctic is not an arbitrary thing, but reflects a real and obvious difference in the biological production of the two regions, points to this difference as one of the most interesting things about the northern waters, and the study of the causes of the difference has only just begun. The fact itself is quite evident: the great

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