

as inlets, while their landward portions are cut off by submarine barriers which are often comparatively shallow. As a consequence the warm water of the Gulf Stream flows along the bottom of the fjords till it reaches the barriers, but is unable to penetrate into the inner basins, which are therefore greatly affected by climate, their water-masses at comparatively shallow depths being stagnant and at a low temperature. We find accordingly an arctic fauna predominating in the inner basins, while the boreal forms met with on the coast and in the seaward portions of the fjords in corresponding depths are for the most part absent.¹ Still there are arctic forms in these latitudes along the coast in the shallow waters of the littoral (and sublittoral) zones, where climatic conditions occasion low temperatures for at any rate part of the year. The fauna at greater depths along the coast, on the other hand, is purely boreal owing to the influence of the Gulf Stream. We are accordingly justified in regarding Lofoten as the southern limit of the boreo-arctic area, so far as the coast tracts are concerned, even though the boreal element preponderates there, and similarly we are entitled to call the inner basins of the fjords boreo-arctic, although in their case it is the arctic element that predominates.²

The coastal areas and fjords east of the North Cape (East Finmark) are altogether boreo-arctic. The fjords here are open arms of the sea, in which there is no distinction between the fauna of the outer and of the inner portions, and, owing to the intermingling of Gulf Stream and polar waters, the purely boreal character of the fauna predominating in West Finmark is absent even in the deeper parts. Moreover, the farther east we go and away from the influence of the Gulf Stream the more do these conditions assert themselves, the fauna becoming gradually more and more purely arctic. A comparison between this area and large parts of one of the best-known areas in high arctic latitudes, namely Spitsbergen, shows how perfectly justified we are in calling it boreo-arctic, for we find a fauna on the Murman coast which, in addition to purely arctic species, includes littoral³

¹ G. O. Sars, "Some Remarks on the Character of the Marine Fauna along the Northern Coasts of Norway," *Tromsø Museums Aarshefter II.*, 1879, p. 60; Nordgaard, *Hydrographical and Biological Investigations in Norwegian Fjords*, Bergen, 1905.

² It must be distinctly stated, however, that this fauna is made up mainly of forms which, although undoubtedly of arctic origin, are distributed over both the boreal and arctic regions; whereas the purely arctic forms are comparatively few. These fjord areas are entitled to be characterised as boreo-arctic owing to the presence of a small number of purely boreal forms with boreo-arctic distribution otherwise.

³ *Purpura lapillus*, *Littorina littorea*, *Nacella pellucida*, *Mytilus edulis*, *Tellina baltica*, *Asterias rubens*, *Balanus balanoides*, *Crangon vulgaris*, *Dynamena pumila*.