continental slopes of the Norwegian Sea. From these localities the young stages spread over the whole sea, including the coast banks and the fjords of Norway. During summer only young individuals are met with, immediately recognizable by the presence of large oil-globules. These minute calani constitute the main nourishment upon which more or less directly the animal life of the Norwegian Sea depends. Even the enormous whalebone whales feed on calani. During the last months of the year the number of calani decreases enormously, and in winter only a few adult individuals remain.

In Chapter VI. Gran gives an account of Lohmann's attempts at calculating the relation between the increment in pelagic plants and the consumption of plants by animals in the fjords at Kiel during the course of a year. According to Lohmann's calculations the volume of plants increases daily by 30 per cent, which increase may be used up by animals without endangering the existence of the plant-stock. Copepoda and other multicellular animals are supposed to need a daily supply of food equivalent to about one-tenth of their own weight. Starting from these assumptions Lohmann attempts to calculate the relation between production and consumption in the course of the year, and arrives at the conclusion that there is generally a surplus of plants except in the winter. For details I refer to the table on p. 384, recording the daily increment of various food producers during the year, which varies greatly from summer to winter, the relation amounting sometimes to 35 : 1.

Conditions in tropical waters.

In tropical and subtropical waters no seasonal changes of this kind appear to take place. At least all the tow-nettings taken in the tropics by various expeditions have always yielded remarkably uniform catches in the upper layers, which are the ones most thoroughly examined, these catches being very small compared with similar catches during summer in boreal waters. As instances of this I may mention that the closing-nets of the "Michael Sars" when hauled from 200 metres to the surface in the Sargasso Sea yielded on the average 3 c.c. of plankton, while in the Norwegian Sea from 85 to 225 c.c. were obtained in numerous similar hauls.[1] Similar results were obtained during the German Plankton Expedition.

It is, however, at present impossible to form any idea whether the volumes thus obtained really tell us anything whatever about the annual production. First of all in boreal waters we have to deal with the enormous seasonal changes. Secondly,

[1] Damas and Koefoed, *loc. cit.*