

tained in the deposits, which fertilises the surface layers of the Blue mud as well as of the *Globigerina* ooze.

Importance of organic matter in the deposits.

Petersen has shown that only the uppermost layer of the mud contains organic detritus, but the quantity of organic substance deposited is not always the most important factor. Where the water is in motion at the bottom, a fine cloud of organic matter is swept along, and in such localities the mud-eaters thrive in great quantities. The fishermen have for a long time profited by this fact, for they do not seek those places (as in pits and channels on the bottom) where mud is laid down, but choose rather the spots where the bottom is covered with coarser particles, and where the finest mud cannot settle. In these places the fish find most food, and the fishermen most fish.

Influence of bottom-currents on the distribution of fish.

Perhaps conditions like these prevail on the eastern Atlantic slope, as, according to the current-measurements of the "Michael Sars," considerable currents extend down to great depths. All such conditions call for further examination, especially in the open ocean, and it may be affirmed that studies of this kind will be essential for an understanding of the quantity of life along the bottom.

Returning to the question of the *geographical distribution of different species of fish*, we may now examine some of the conditions which influence that distribution, according to the present state of our knowledge.

We have seen that the species *Macrurus armatus* is known from the abyssal plain in the Pacific as well as in the Antarctic and Atlantic Oceans. The chart (Fig. 308) indicates the localities of capture and also the temperature, and shows at a glance that, notwithstanding the immense geographical range of this species, it is taken only where the range of temperature is very small ( $1^{\circ}$  to  $3^{\circ}$  C.). The species is not local; it is not limited by distance, but by certain physical conditions, which in this case prevail over an immense geographical area.

Distribution of different species of fish.

Temperatures in abyssal depths are, as we have seen in Chapter V., on the whole very uniform. It is therefore interesting to note that it is especially the abyssal forms that are known from wide areas; thus, for instance, *Macrurus filicauda*, known from the Pacific and Antarctic, has a bathymetrical range from 2515 to 4843 metres. *Macrurus parallelus*, known from New Zealand, Japan, Ceylon, South-west Africa, ranges down to 1300 metres. *Halosauropsis macrochir*, known from the Southern