

It must, indeed, be admitted that the presence of a single common form in two widely distant seas—such as the Arctic and Antarctic Oceans—throws a difficulty in the way of admitting different local floras. Thus, if only a single species could, by currents or from any other cause, have migrated in one or more stages from one point to another, it must follow that the general mingling of the various marine genera and species is reduced to a mere question of time. It remains, however, to be proved that in the polar seas the Diatoms that occur, though admittedly belonging to the same genus, are also positively of the same species. On account of our imperfect knowledge and of our limited means of observation, it cannot be asserted that two such frustules do not form two distinct species, though their specific characters may *appear to be identical*.

But allowing that some common species do exist in widely separated oceans, it may be safely concluded that, since the complete fusion of all marine floras has not taken place in the course of the thousands of centuries during which Diatoms have existed, it will not happen for many ages to come.

What, then, is the meaning of setting a limit of any kind to the habitat of marine species? In the present state of knowledge no definite information can be offered, and it may be long before the circumstances under which the development of one diatomaceous form takes place in a given locality, to the exclusion of another, are fully known. Remembering, however, the great facility with which Diatoms adapt themselves to the most varied conditions of life, the numerous opportunities afforded for the distribution of microscopical marine organisms, and the occurrence of different temperatures at different depths in the sea in the same latitude, it may with some probability be asserted that the extension of species in the sea is determined to a great extent by the temperature of the water. If such were not the case it would not be easy to explain why the Diatoms of temperate seas should not be found in company with glacial forms, while, on the other hand, it must be expected that, apart from considerations of pressure and other physical conditions of environment, the species of the polar seas should be met with in great depths in temperate waters.

Another circumstance which may have tended to prevent the fusion of local microfloræ into a universal one may here be referred to, having been recently pointed out by Mr John Murray in a preliminary report of observations made on board the Challenger, read before the Royal Society of London.¹

“In the Southern Ocean,” says Mr Murray, “south of Kerguelen, in the Arafura Sea, off the coasts of Japan, New Guinea, North America, and in enclosed bays and river deltas,—in short, wherever the specific gravity of the sea is low from an admixture of fresh water, we have met with very many Diatoms on the surface.”

After examining an abundant supply of materials from the Red Sea I have been led to

¹ On Surface Organisms and their Relation to Ocean Deposits, *Proc. Roy. Soc. Lond.*, vol. xxiv. p. 533, 1876.