

the same conclusion. Here Diatoms of different species do occur, but they are relatively scarce—a circumstance which may be explained by the fact that no large rivers flow into this area to compensate for the enormous evaporation to which it is subjected on account of its vicinity to the equator, so that its waters are more dense and more heavily charged with saline constituents.

If this explanation be correct, it follows that the warmest, and, by their great evaporation, the most saline parts of the ocean, serve as all but insuperable barriers to the mixture of different floras, so that each may retain almost indefinitely its own special characteristics.

Silica, of which the walls of Diatoms are composed, exists in all kinds of water, but generally in so small quantities that its proportion cannot be determined. Hence Professor Bischoff has lately asserted that siliceous Infusoria—meaning thereby Diatoms—must take into their interior, in order to form their valves, the same quantity of water, in proportion to their mass, as would be swallowed by a man who drank a cubic foot per second.

If water were absolutely devoid of silica, Diatoms could not exist, but this and other important substances are being continually carried into the sea by rivers. The calcareous material present in the ocean goes to form the tests of Foraminifera and Crustacea and the coral formations of tropical zones, while the silica is removed by Polycistinæ, Radiolaria, certain Foraminifera, Spongidæ, and Diatoms.

The secretion of lime takes place, according to Mr. Murray, most actively in the warmest and saltiest seas where solar evaporation is most rapid, and it is a fact no less striking that the greatest abundance of Diatoms is found in localities where the water is of relatively low specific gravity and the temperature in some instances likewise low.

THE BATHYMETRICAL LIMIT OF DIATOMS.

Problems of distribution are, from the very nature of the conditions, much more difficult to solve in the case of marine than of terrestrial organisms, and with regard to the Diatomaceæ it has hitherto been impossible to define the greatest depths at which they are capable of surviving in the various ocean basins. A method has been already referred to by the application of which it may be proved whether they do vegetate at any given depth (pp. 2, 3), but in addition to this, careful records should be made of the occurrence of living frustules on fragments of corals, shells, &c., which are brought up from a known depth, as a check is thereby placed on the experimental working out of this most important question.

From a knowledge of their physiological functions of decomposing carbonic acid and evolving oxygen under the influence of sunlight, it may be inferred that Diatoms cannot live where light is unable to penetrate. With this theoretical conclusion daily experience