through, each Diatom or other organism to enable it to form its siliceous frustule or skeleton would be enormous. In the case of the carbonate of lime organisms it has been shown that they can obtain the material for their shells from the other salts of lime in solution in sea-water.[1] In the case of the silica, however, the total silica in solution in sea-water can only be present in the one condition, so that an analogous interpretation is impossible. Is there then any other source from which these organisms may derive their silica?

It appears to have been generally accepted by recent writers that all the clayey matter held in suspension in river water is thrown down when the river water enters, and is mixed with the waters of, the ocean, and there is little doubt that this view is in the main correct.[2] It is an undoubted fact that almost all the clay held in suspension in fresh water falls rapidly to the bottom on mixture with sea-water. It appears, however, that this precipitation takes place more rapidly at a high than at a low temperature;[3] for instance, a sample of sea-water with clay in suspension was divided into two portions and allowed to stand for twenty-four hours, the one portion at a temperature of 50° F. and the other at 80° F.; at the end of that time in the former case 0·0188 gramme per litre remained in suspension, and in the latter only 0·0083 gramme per litre. It would also appear that a small quantity of clayey matter may be held in suspension for an indefinite time, even in the saltest and warmest waters of the ocean. A large sample of water (14 litres) from the North Atlantic, lat. 51° 20′ N., long. 31° W., contained 0·0052 gramme per litre, or about 1601 tons of clay in a cubic mile of sea-water. A similar sample from the centre of the Mediterranean gave 0·0066 gramme per litre, or 2031 tons of clay per cubic mile. Another sample from the German Ocean gave nearly identical results as in the water from the Mediterranean. It is true that the soluble silica in a cubic mile of sea-water (17,000 tons) greatly exceeds the quantity of silica in the suspended clay found in the above experiments, but Murray and Irvine suggest that it is not improbable that the clayey matter in suspension contains silica in a more available form than the silica in solution, from the clay being locally abundant in certain layers, in place of being dissolved in 250,000 times its weight of water, as would be the case with silica in solution.

If, then, the pelagic organisms which secrete silica for their frustules, shells, and skeletons, obtain it from the hydrated silicate of alumina or clay held in suspension in sea-water, as well as from the silica in solution in sea-water, we may in this way have some explanation of the fact that these organisms abound in brackish waters and waters of a low salinity and low temperature, where, for the reasons stated above, this finely-

[1] Murray and Irvine, *Proc. Roy. Soc. Edin.*, vol. xvii. p. 91.

[2] See E. W. Hilgard, *Amer. Journ. Sci.*, ser. 3, vol. vi. p. 338, 1873; W. H. Sidell in Humphreys and Abbot's *Report on the Mississippi*, App. A. No. 2, pp. 495 *et seq.*, 1876; J. D. Dana, *Manual of Geology*, 3rd ed., p. 677, 1880.

[3] Murray and Irvine, "On Silica and the Siliceous Remains of Organisms in Modern Seas," *Proc. Roy. Soc. Edin.*, vol. xviii. pp. 229–250, 1891.