

of calcium or magnesium silicate, although magnesium silicate is known to be soluble to only 1 part in 100,000 of sea-water.¹ This perhaps indicates that the silica in solution in the sea is always below saturation-point, so that a local concentration large enough to determine precipitation never occurs. Or again, excess silica perhaps combines with what little alumina there is in sea-water and is deposited as clay; if that were the case, the limit of dissolved silica would be set by the solubility of this substance, which may well be less than that of magnesium silicate. At any rate, the quantity of silica really dissolved in sea-water is extremely small. According to the most recent and trustworthy determinations,² there is on the average about one part, and never more than two parts, per million in North Sea and Baltic waters.

Although for obvious reasons vastly less silica is produced, by biological agencies, in the waters of the sea than calcium carbonate, the former, like the latter, is found in almost all submarine deposits. When siliceous remains fall into a calcareous deposit, the silica has little tendency to combine with lime, since silicic at low temperatures is an even weaker acid than carbonic; but, the process of peptisation being accelerated by the higher alkalinity of the superjacent waters, we should expect the predominance of lime to favour the dissolution of silica. This seems to be borne out by the fact that silica is least abundant in the most calcareous bottoms of the open sea, and also by the almost total absence of silica in coral reefs and muds.³ Again, essentially siliceous accumulations (Radiolarian ooze) are characteristic of the very deepest parts of the ocean, where calcareous remains have such enormous columns of sea to fall through that they may fail to reach the bottom. There is thus a tendency for silica and calcium carbonate to be mutually exclusive. In terrestrial calcareous deposits (chalk) we find imprisoned silica going into solution, migrating to centres of coagulation and forming nodular segregations (flint). No such phenomenon is observed at the bottom of the sea, where the silica brought into solution has probably no difficulty in diffusing into the hydrosphere out of the comparatively loose deposit.

The soluble silica of the sea is derived ultimately from felspathic minerals, and the greater bulk is introduced from

¹ Murray and Irvine, *Proc. Roy. Soc. Edin.*, vol. xviii. p. 238, 1891.

² Raben, *Wissensch. Meeresuntersuchungen*, Kiel, vol. viii. pp. 99 and 277, 1905.

³ The Atoll of Funafuti: Report of Coral Reef Committee of the Royal Society; Chemical Examination of the Materials from Funafuti, by J. W. Judd, p. 370, 1904.