dried, may afterwards be immersed for any length of time in water without becoming soft again. Hence it is found desirable to shape the stones which are to be used in architecture while they are yet soft and wet, and while they contain their "quarry-water," as it is called; also to break up stone intended for roads when soft, and then leave it to dry in the air for months that it may harden. Such induration may perhaps be accounted for by supposing the water, which penetrates the minutest pores of rocks, to deposit, on evaporation, carbonate of lime, iron, silex, and other minerals previously held in solution, and thereby to fill up the pores partially. These particles, on crystallizing, would not only be themselves deprived of freedom of motion, but would also bind together other portions of the rock which before were loosely aggregated. On the same principle wet sand and mud become as hard as stone when frozen; because one ingredient of the mass, namely, the water, has crystallized, so as to hold firmly together all the separate particles of which the loose mud and sand were composed.

Dr. MacCulloch mentions a sandstone in Skye, which may be moulded like dough when first found; and some simple minerals, which are rigid and as hard as glass in our cabinets, are often flexible and soft in their native beds; this is the case with asbestos, sahlite, tremolite, and chalcedony, and it is reported also to happen in the case of the beryl.*

The marl recently deposited at the bottom of Lake Superior, in North America, is soft, and often filled with freshwater shells; but if a piece be taken up and dried, it becomes so hard that it can only be broken by a smart blow of the hammer. If the lake therefore was drained, such a deposit would be found to consist of strata of marlstone, like that observed in many ancient European formations, and like them containing freshwater shells.

It is probable that some of the heterogeneous materials which rivers transport to the sea may at once set under water, like the artificial mixture called pozzolana, which consists of fine volcanic sand charged with about 20 per cent. of oxide of iron, and the addition of a small quantity of lime. This substance hardens, and becomes a solid stone in water, and was used by the Romans in constructing the foundations of buildings in the sea.

Consolidation in these cases is brought about by the action of chemical affinity on finely comminuted matter previously suspended in water. After deposition similar particles seem to exert a mutual attraction on each other, and congregate together in particular spots, forming lumps, nodules, and concretions. Thus in many argillaceous deposits there are calcareous balls, or spherical concretions, ranged in layers parallel to the general stratification; an arrangement which took place after the shale or marl had been thrown down in successive laminæ; for these laminæ

* Dr. MacCulloch, Syst. of Geol. vol. i. p. 123.