stony near Kelloway. In this district there are numerous fossil shells which have decomposed, having for the most part left only their casts. The calcareous matter hence derived has evidently served, at some former period, as a cement to the siliceous grains of sand, and thus a solid sandstone has been produced. If we take fragments of many other argillaceous grits, retaining the casts of shells, and plunge them into dilute muriatic or other acid, we see them immediately changed into common sand and mud; the cement of lime derived from the shells, having been dissolved by the acid.

Traces of impressions and casts are often extremely faint. In some loose sands of recent date we meet with shells in so advanced a stage of decomposition as to crumble into powder when touched. It is clear that water percolating such strata may soon remove the calcareous matter of the shell; and, unless circumstances cause the carbonate of lime to be again deposited, the grains of sand will not be cemented together; in which case no memorial of the fossil will remain. The absence of organic remains from many aqueous rocks may be thus explained; but we may presume that in many of them no fossils were ever imbedded, as there are extensive tracts on the bottoms of existing seas even of moderate depth on which no fragment of shell, coral, or other living creature can be detected by dredging. On the other hand, there are depths where the zero of animal life has been approached; as, for example, in the Mediterranean, at the depth of about 230 fathoms, according to the researches of Prof. E. Forbes. In the Ægean Sea a deposit of yellowish mud of a very uniform character, and closely resembling chalk, is going on in regions below 230 fathoms, and this formation must be wholly devoid of organic remains.*

In what manner silex and carbonate of lime may become widely diffused in small quantities through the waters which permeate the earth's crust will be spoken of presently, when the petrifaction of fossil bodies is considered; but I may remark here that such waters are always passing in the case of thermal springs from hotter to colder parts of the interior of the earth; and as often as the temperature of the solvent is lowered, mineral matter has a tendency to separate from it and solidify. Thus a stony cement is often supplied to sand, pebbles, or any fragmentary mixture. In some conglomerates, like the pudding-stone of Hertfordshire (a Lower Eocene deposit), pebbles of flint and grains of sand are united by a siliceous cement so firmly, that if a block be fractured the rent passes as readily through the pebbles as through the cement.

It is probable that many strata became solid at the time when they emerged from the waters in which they were deposited, and when they first formed a part of the dry land. A well-known fact seems to confirm this idea: by far the greater number of the stones used for building and road-making are much softer when first taken from the quarry than after they have been long exposed to the air; and these, when once

* Report Brit. Ass. 1843, p. 178.