

been deposited from subterranean waters, at a high temperature.* Calcareous or cretaceous matter is also ejected during aqueous volcanic eruptions. According to Ferrara, streams of liquid chalk, or chalk in a state of mud, were ejected from the mud volcano of Macaluba, in Sicily, in 1777, which, in a short space, formed a bed several feet in thickness. Beds of limestone may have been formed by similar calcareous eruptions, in which the lime might be sometimes in solution, and sometimes mechanically suspended; and the numerous remains of testaceous animals in limestone appear to indicate, that the calcareous solutions were favourable to the growth of animals, whose coverings contain so much calcareous matter. Nor is it necessary to suppose, that these aqueous eruptions were always sudden, and attended with violent convulsions, for when a passage was once opened, they may have risen slowly, and have been diffused in a tranquil state, and by gradual deposition, or condensation, may have enveloped the most delicate animals or vegetables, without injuring their external form.—Second edition, 1815.

If the geologist can admit such a condition of the ancient world as above described, a condition which, on a smaller scale, might be proved to have existed since the period of authentic history: if he will further admit, that, before the formation of chalk, a great portion of what is now England, and the northern Continent of Europe, was covered by a deep ocean, interspersed with islands, and surrounded by ancient continents, and this few modern geologists will deny; then, if we allow submarine aqueous eruptions of calcareous matter, and siliceous solutions from thermal waters, to have been poured into this deep ancient ocean, we shall have all the circumstances required, to form thick beds of chalk, interspersed with nodules of flint. In an experiment on clay formed into a stiff paste, by admixture with a saturated solution of alum, it was found, on breaking the clay when dry, that alum was interspersed through the mass in distinct crystals and concretions. In the same manner, we may suppose that the siliceous solutions, spread through the calcareous matter, would separate into distinct concretions, filling the cavities and pores or zoophytes—such as sponges and alcyonia, or of shells deposited in the chalk. Every fact connected with the history of chalk, proves that it was formed in a very tranquil sea, and not by the drift or detritus of more ancient rocks. Mr. Mantell, whose almost daily observations on the chalk formation scarcely suffer an important fact to escape his notice, says, that, in the whole of these immense beds that he has examined, the occurrence of a single fragment or pebble of more ancient rocks in chalk is extremely rare;

* M. Brongniart, to whom I sent a copy of this work, of the edition of 1815, subsequently admitted a similar formation of the siliceous beds and millstone in the Paris basin, namely, that they were deposited by thermal waters holding siliceous solution.