tuent principles of the animal or vegetable substances, changing the latter into stone, without modifying the arrangement of the molecules so as to alter the external form, seems the only mode by which such transmutations can have been effected. The production of congelation, by a simple abstraction of caloric, is akin to this change; but petrifaction is induced by the introduction of another principle.* As to density, the most subtle gas may acquire the greatest solidity; as, for example, in the union of oxygen with metallic substances.

27. ARTIFICIAL PETRIFACTIONS.—M. Goppert has published the result of an interesting investigation of the condition of fossil plants, and the process of petrifaction. Layers of ironstone nodules are very common in the carboniferous strata. They appear to have once constituted continuous layers, the nodules having been produced by segregation, *i. e.* the substance of which they are composed, separated from the constituent parts of the rock after deposition.† The first segregation often appears to have been caused by the presence of some extraneous matter, sometimes a trilobite, or a shell; very commonly a leaf of a fern (as in Tab. 123, fig. 1, 2). Mr. Parkinson had remarked, that the leaf in these nodules might sometimes be separated in the form of a carbonaceous film; and M. Goppert

* See Pidgeon's "Cuvier on Fossil Animals."

† De la Beche, Researches in Theoretical Geology, p. 96.