

to produce life in an agglomeration of the molecules; and since these laws will always be imperfectly known, it will at least be rash to maintain that an infinite intelligence did not impose them; since they are manifested by their results."—*Dictionnaire Classique, d'Histoire Naturelle*, art. *Matiere*.

The "observations" to which this writer refers to sustain his hypothesis are those which had been made upon certain vegetable infusions, which, in certain circumstances, exhibited minute particles in motion, apparently by vital forces. These were called *monads*, and were not supposed to be distinct animals, but only atoms, ready to be organized. The more modern and accurate researches of Ehrenberg and others, however, have shown, beyond all doubt, that these monads are true animals, the minutest of all living beings hitherto discovered. Not less than twenty-six species of them have been described and figured by microscopists, the smallest of which never exceeds the twelve thousandth of an inch in diameter.

The vegetable physiologists have described certain peculiar motions in the minute vessels of plants, that might readily be regarded as matter essentially vital. I refer to what they call *rotation* and *cyclosis*. But these are never seen save in the living plant; and, therefore, seem dependent on the general life of the vegetable.

There is, however, danger of mistaking certain motions of the particles of matter, by chemical agency, for the effect of vitality. A curious example is thus described by Ehrenberg, which was discovered by Professor Bornsdorff. "If a solution of the chloride of aluminum be dropped into a solution of potassa, by the alternate precipitation and solution of the aluminum, in the excess of the alkali, an appearance will be given to the drop of aluminate matter, by the chemical changes and reactions which take place, as if the *Amæba diffluens* were actually present, both as to its form and evolutions, and will seem to be alive. Such appearance is considered by its able discoverer as bearing the same relationship to the real animalcule as a doll, or a figure moved by mechanism, does to a living child."

We see, then, that the supports on which rests the doctrine of the essential vitality of matter, give way before better in-