

It would seem from this that an atom of the former breaks up into about 100 atoms of the latter, and in this way a new element is born, although in this case it is probable that the mother atom is split into two or more kinds. It will be seen from this that even atoms may be split up. Indeed, there are reasons for believing that the hydrogen atom consists of a nuclear ion about which some 700 particles or electrons revolve, and an atom of mercury is believed to consist of not less than 100,000 electrons. Atoms and electrons are in constant motion, and so small are they that the distances between them may be relatively as great as those between the planets of the solar system. The living cell is composed of molecules, made up of atoms, composed of electrons that are in constant and systematic motion, and may be compared to a group of stars with attendant suns, each of which is surrounded by its own planets. A molecule of albumin is of like composition.

Another property of matter is that it is gravitative. Every particle of matter attracts every other particle. When this attraction is manifest between masses it is called gravitation; between molecules, it is called cohesion or adhesion, as the molecules held together are alike or unlike; between atoms it is known as chemical affinity or chemism.

Still another property of matter is inertia, by which term we indicate the inability of matter to change either its rate or direction of motion without being acted upon by other matter. It is of great importance that this property of matter be held in mind in the study of cellular chemistry, and the proper mental picture of a cell molecule represents each of the atoms in the molecule, and each electron in each atom moving each about its centre and each at a definite rate. If such a cell molecule could be cut off permanently from the disturbing influence of other matter, its atoms and electrons would continue the same motions, unchanged in direction or rate, throughout eternity, but, as we shall later see, it would be impossible for living matter to continue to live apart from other matter. Within the living cell molecule change in number, kind, and arrangement of atoms is constant; and the direction and rate of the motion of the atoms are also susceptible to the influence of other matter and are of constant occurrence. Whole groups of atoms are physiologically being dropped from the cellular molecule and being replaced by other groups split off from the pabulum upon which the cell feeds. In this way the cell renews itself and keeps itself supplied with energy.

Some of the most noted physicists are inclined to the belief that matter is made up of electric charges, but recognize that this is not a demonstrated fact as yet, and speak with caution. Lodge says: "There *may* possibly be two different kinds of inertia,