

To start *ab initio*, the cell is made up of matter, and the newer views on matter must be taken into consideration in formulating a conception of the cell. When matter becomes endowed with life it does not cease to be matter; it does not lose its inherent properties; it is not released from the laws that govern its structure, its attractions, and its motions. In studying the organized cell of living things, whether vegetable or animal, it should always be borne in mind that it is material in composition and subject to the fundamental laws that govern matter, and possessed of those properties essential to matter. In order that this point, so essential to a proper understanding of the subject, should be thoroughly appreciated, it may be best to recall some of the properties of matter as taught by the most advanced science of the day.

Tait says: "Matter is that which can be perceived by the senses, or is that which can be acted upon by or can exert force." Since force is the result of motion, we may say that anything and everything that moves or can be moved, or whose position in space may be changed, is matter. There are many forms of matter that cannot be seen or felt, and can be recognized only by their motions.

Matter is indestructible; it may be successively solid, liquid and gas, but in undergoing these changes it neither gains nor loses. It has always been, and it always will be. It is without beginning and will be without end. Matter consists of infinitely small particles, called atoms. According to the computation of Lord Kelvin, the diameter of an atom is not greater than 1/50,000,000 of an inch; however, all atoms are not of the same size or weight. When like atoms combine they form chemical elements, of which about seventy are known. The hydrogen atom is the lightest of all known elements, and it therefore is taken as the base or standard in the determination of atomic weights. When unlike atoms combine, chemical compounds are formed, and the number of these is beyond computation. It was supposed, until the discovery and study of radium, that one chemical element is never converted into another, and consequently that the number of kinds of atoms is fixed and unchangeable. However, it has been found that the α -rays of radium consist of most minute particles, which, when confined in glass, condense and form another element, helium. With this demonstration of the formation of one element from another it is within the range of sanity to suppose that all the elements have been developed from a primordial ancestor, probably from the universal ether which pervades all space. Nothing has been created; everything has grown. Even silver, iron, and other metals came into existence by being cast off from some common ancestral element. The atomic weight of radium is 225 and that of helium 2.02.