

imminent. It should be distinctly understood, however, that it is not the mere size of the molecules that makes them labile, but rather the manner in which they are linked together, and the amount of potential energy which is included in the molecule."

It is probable that in the absorption of energy by the living molecule oxygen is relieved from its combination with carbon or hydrogen and is attached to nitrogen, while in the liberation of energy the reverse takes place. Nitrogen and phosphorus, sometimes with iron and possibly manganese, seem to be, as it were, the master elements within the living molecule. It is by virtue of their chemism that groups are torn from extra-cellular matter, taken into the living molecule and assimilated by an atomic rearrangement; and furthermore, it is on account of the lability of the compound thus formed that potential energy is converted into kinetic and cell work is accomplished.

The question of the origin of life on this world has been ably discussed by eminent chemists, physicists and biologists. The cosmozoa theory proposed by Richter holds that cellular life has always existed, and has been transferred from one planet to another by meteors and cosmic dust. Richter says: "*Omne vivum ab aeternitate e cellula.*" Helmholtz and Lord Kelvin have pronounced this theory not unscientific, and the former makes the following statement: "Meteoric stones sometimes contain hydrocarbon compounds; the intrinsic light of the heads of comets shows a spectrum that is very similar to that of the incandescent electric light in gases containing hydrocarbon. But carbon is the characteristic element of this organic compound, of which living bodies are composed. Who can say whether these bodies that swarm everywhere through space do not spread also the germs of life whenever a new world has become capable of affording a dwelling-place to organic creatures? And this life we might, perhaps, have reason to regard as even allied to our own in germ, however various may be the forms in which it might adapt itself to the conditions of its new dwelling-place."

Preyer objects to the cosmozoa theory that it only sets the question back to, How did life originate in the universe? and Helmholtz says: "The true alternative is evident; organic life has either begun to exist at some one time, or has existed from eternity."

Pflüger's theory of the origin of life is the most scientific yet proposed. He argues that living proteid differs from dead proteid by the existence in the former of a cyanogen radicle. He says: "In the formation of cell substance, i.e., of living proteid out of food proteid, a change of the latter takes place, the atoms of nitrogen going into a cyanogen-like relation with the atoms of carbon, probably with the absorption of considerable heat." Pflüger calls attention to the resemblances between cyanic acid