

"organisms are not *ordinary conservative systems*, and the extent to which they *diverge from the principle of the conservation of energy*" is another indication to us that in the organism, we come in touch with "phenomena which are not yet, at all events, reduced to physical laws."

I wish to discuss how far this statement is true, for if true it immediately defines the difference between phenomena of animate and inanimate creation. It will be best, I think, to study the subject by analysing that property of living matter which is the most evident outcome of the incessant disturbance of equilibrium above mentioned—I mean growth.

If we seek to test the relative importance of the various forms in which vital activity manifests itself:—motion, sensation, assimilation, excretion, reproduction, we are bound to see that one and all of these subserve growth. If the individual moves, an ultimate analysis shows that the primary object in motion is either to obtain more food, or more accurately the primary result of that movement is to approach and assimilate foodstuffs, and that food obtained is of benefit, as it can be used for further growth; or is to place itself at a greater distance from disintegrative forces. The same is true also with regard to sensation. That is of benefit primarily in order to acquaint the individual living unit with, on the one hand its closeness to food stuffs, or on the other hand, with the presence of physical or other agents deleterious to the organism. Assimilation and excretion are but the auxiliaries in the due utilization of materials which aid growth, and in removing from the organism all materials whose continued presence would disturb the process. Growth then, is the central or essential phenomenon of life, and to understand life, it is necessary that one gains a clear idea of what is the essential nature of this process of growth.

Let us then consider what growth means. It means *quantitative* increase in the individual matter endowed with life, increase in the living substance. That individual may consist of a single cell, may be an almost infinitesimal micrococcus, for example, or, at the other pole, say in the elephant or in the whale, may consist of a huge aggregate of countless millions of cells, all associated and depending the one upon the other. In this latter case it is the separate cells which, some or all of them, increase in size, and with this, increase also in number. Each cell of such a multicellular organism is, we know, derived from a primitive fertilised ovum by repeated division of the original single cell; and in this process of division, there is a partition of the bioplasm, of the vital matter. During the period of most rapid growth, in the stage of development, this increase in size of the individual cells and their multiplication is most rapid, and when we