

"Bionomics", but again falling into verbal disquisitions on "spirits" and "temperaments".

(2) FUNCTIONS OF ORGANS.—As the anatomists, scalpel in hand, disclosed the intricate mechanism of the living engine, the physiologists were bound to follow, and the study of the functions of organs began. Harvey's investigation of the heart was an early type of this kind of work, and Johannes Müller may be noted as one of the first to broaden the study by making it comparative.

(3) PROPERTIES OF TISSUES.—Bichat was physiologist as well as morphologist, and sought to express the functions of an organ, like the heart, in terms of the properties of its component tissues. He thus "not only deepened both morphology and physiology by a new analysis, but showed them to coincide in the study of tissue".

(4) PHASES OF CELL-LIFE.—What has been said of Bichat may also be said of Schwann, for there was a physiological side to his cell-theory, namely, the idea, as Prof. E. Ray Lankester states it, "that the differences in the properties of the different tissues and organs of animals and plants depend on a difference in the chemical and physical activity of the constituent cells, resulting in a difference in the form of the cells, and in a concomitant difference of function". The same idea was suggested by Goodsir, and developed in relation to pathology by Virchow.

(5) METABOLISM OF PROTOPLASM.—But even in Schwann's mind the early preoccupation with the cell as such gave place to a proper estimate of the protoplasm itself. Herein the history of physiology shows what Prof. Michael Foster has called "a change of front". The riddle of life has henceforth to be read, as far as may be, in terms of the chemical changes (metabolism) associated with the living matter.

Prof. Geddes's short paper emphasizes the parallel evolution of the two sides of biological science, and rationalizes the history as a logically progressive analysis. From external form to the internal organs, from organs to the tissues which compose them, from tissues to their elementary units or cells, and from cells to the living matter itself, has been the progress of the science of structure or morphology. From habit and temperament to the work of organs, from the functions of organs to the properties of tissues, from these to the activities of cells, and from these finally to the chemical and physical changes in the living matter or protoplasm,