

complex in structure, but has nevertheless great powers of persistence and of growth.

It may now be concluded that in the more or less strict continuity of the successive sets of reproductive elements lies the solution of the main problem of heredity. This appears the most convenient place to notice various suggestions made as to what it is exactly that is continuous. The earlier of these suggestions were brought forward indeed before the notion of continuity had its present definite form, but it seems appropriate to introduce them here.

*The Memory Theories.*—Prof. Hering in Prag and Mr. Samuel Butler in England suggested about the same time a psychical aspect of the hereditary continuity. The two suggestions may be so far summed up together. Memory is a general function of organized matter, and the reproduction of parental likeness is the result of unconscious recollection of the past. What are ordinarily called memory, habit, instinct, and embryonic reconstruction are all referable to the memory of living matter. Hering finds the basis of this unconscious memory in the persistence of the undulatory movements supposed to be characteristic of the molecules. These undulations are sensitive to change, and room is thus left for variability, but their tendency to persist in their established harmony is the basis of heredity.

Hæckel also emphasized the luminous metaphor of "organic memory", and sought to express it in terms of molecular motion. His theory is summed up in the characteristic phrase "perigenesis of the plastidules". Comparing the course of phylogenetic development to a complex, ramified series of wave-lines, in which a single life is represented by a single wave, he imagines a similar ontogenetic wave-motion in the development of the individual. "The developing impulse which in the one case is transferred from the ancestral species to the whole group of species, and in the other case from the ancestral cell to the entire group of cells, assumes in both cases the same form of a branching wave-motion."