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## ON HEREDITY.

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HEREDITY is by no means a new subject, and certain of its aspects were under discussion as far back as the time of Aristotle. The prominence which it has assumed of late years is in connection with its bearing on the Darwinian Theory of Natural Selection, and, consequently, biologists generally have had their attention directed to it. But in its relations to Man, his structure, functions, and diseases, it has long occupied a prominent position in the minds of anatomists, physiologists, and physicians. That certain diseases, for example, are hereditary was recognized by Hippocrates, who stated generally that hereditary diseases are difficult to remove; and the influence which the hereditary transmission of disease exercises upon the duration of life is the subject of a chapter in numerous works on practical medicine, and forms an important element in the valuation of lives for life insurance.

The first aspect of the question which has to be determined is whether any physical basis can be found for Heredity. Is there any evidence that the two parents contribute each a portion of its substance to the production of the offspring, so that a physical continuity is established between successive generations? The careful study, especially during the last few years, of the development of a number of species of animals, mostly but not exclusively among the Invertebrata, by various observers,—of whom I may especially mention Bütschli, Fol, E. Van Beneden, and Hertwig,—has established the important fact that the young animal arises by the fusion within the egg or germ-cell of an extremely minute particle derived from the male parent with an almost equally minute particle derived from the germ-cell produced by the female parent. These particles are technically termed in the former case the *male pronucleus*, in the latter the *female pronucleus*, and the body formed by their fusion is called the *segmentation nucleus*. These nuclei are so small that it seems almost a contradiction in terms to speak of their magnitude; rather one might say their minimitude, for it requires the higher powers of the best microscopes to see them and follow out the process of conjugation. But, notwithstanding their extreme minuteness, the pronuclei and the segmentation nucleus are complex both in chemical and molecular structure. From the segmentation nucleus produced by the fusion of the pronuclei with each other,