

theory of Descent, and gives the Darwinian principle of selection the widest scope of activity.

The many morphological and physiological reasons that contradict Weismann's theory of germ-plasma have already been brought forward in detail by Virchow, Kölliker, Detmer, Eimer, Herbert Spencer, and others. And, while agreeing with them, I wish especially also to point out that the permanent separation of the two species of plasma in the germ-cell is not only not proved by microscopic investigation, but is rendered extremely improbable by the facts of the so-called "cleavage of the egg," and gastrulation. Besides which, Weismann is thus obliged to assume internal unknown causes for the development of his germ-plasma, and these are as metaphysical and teleological as the inherent principle of perfecting assumed by Naegeli for his idioplasm; the unknown cause differs only in name. Finally, as Weismann recognizes only the transmissibility of indirect or potential variations, and altogether rejects the transmissibility of direct or actual adaptation, he fails, I think, to give a mechanical explanation of the most important phenomena of transformation.

V. *A Theory of Intracellular Pangenesis* (1889) has quite recently been brought forward by Hugo de Vries, a botanist, in direct connection with Darwin's hypothesis, but with this essential difference, that he drops Darwin's supposition of the transport of the minute germs throughout the body. Vries assumes this transport as only *within* every single cell; he gives a more careful definition of the minute germs or gemmules (which he calls *Pangens*), and assumes that *every single transmissible quality* is connected with some such material bearer, an invisible pangen. The entire living