

also has arisen. He calls his theory the *Continuity of the Germ-plasm*, and he bases it upon the supposition that in each individual a portion of the specific germ-plasm derived from the germ-cell of the parent is not used up in the construction of the body of that individual, but is reserved unchanged for the formation of the germ-cells of the succeeding generation. Thus, like Mr. Galton, he recognizes that in the stirp or germ there are two classes of cells destined for entirely distinct purposes: the one for the development of the *soma*, or body of the individual, which class he calls the *somatic* cells; the other for the perpetuation of the species, i.e., for reproduction.

In further exposition of his theory Weismann goes on to say, as the process of fertilization is attended by a conjugation of the nuclei of the reproductive cells—the pronuclei previously referred to—that the nuclear substance must be the sole bearer of hereditary tendencies. Each of the two uniting nuclei would contain the germ-plasm of one parent, and this germ-plasm also would contain that of the grandparents as well as that of all previous generations.

To make these somewhat abstract propositions a little clearer, I have devised the following graphic mode of representation:



Let the capital letters, A, B, C, D, etc., express a series of successive generations. Suppose A to be the starting-point, and to represent the somatic or personal structure of an individual; then *a* may stand for the reproductive cells, or germ-plasm, from which the offspring of A, viz. B, is produced. B, like A, has both a personal structure and reproductive cells or germ-plasm, the latter of which is represented by the letters *ab*, which are intended to show that, while belonging to B, they have a line of continuity with A. C stands for an individual of the third generation, in which the reproductive plasm is indicated by *abc*, to express that, though within the body of C, the germ-plasm is continuous with that of both *b* and *a*. D also contains the reproductive cells *abcd*, which are continuous with the germ-plasm of the three preceding generations, and so on.

It follows, therefore, from this theory, that the germ-plasm possesses throughout the same complex chemical and molecular structure, and that it would pass through the same stages when the conditions of development are the same, so that the same final product would arise. Each successive generation, therefore, would have an identical starting-point, so that an identical product would arise from all of them.

Weismann does not absolutely assert that an organism cannot exercise a modifying influence upon the germ-cells within it; yet he limits this influence to such slight effects as that which would arise from the nutrition and growth of the individual, and the reaction of the germ-cell upon changes of nutrition caused by alteration in growth at the periphery, leading to some change in the size, number, and arrangements of its molecular units. But he throws great doubt upon the existence of such a reaction, and he, more emphatically