

Experiments of various kinds have been made upon animal and plant organisms. It has been found that external stimuli affect the development of characters in three ways. They modify the development of inherited characters; they actually condition the production of characters whose heridity determiners are present in the germplasm; and they may cause germinal variations which result in the appearance of new germinal characters. The followers of Weismann's doctrine have tried to show us that such phenomena as external influences are incomprehensible since the germinal units are independent in themselves, only deriving nourishment thru the soma. But external influences such as excess of heat, light, nourishment, and other physical and chemical stimuli modify the general behavior and structure of the organisms experimented upon. It has been found that important changes in coloring, markings, and size of the butterfly, as well as in the shape in some of its organs were changes in its general vigor. This does not mean that the differences should be merely those of vigor, but they show that acquired differences of general or local vigor may weaken or reinforce certain physiological functions, which result in their turn in important changes in size, color, or reproduction. They alter the functions of vital organs, and thru them those characters of specific value are modified. Such changes cannot but be inherited for a number of generations, just as an inherent tendency toward tuberculosis or cardiac weakness may be transmitted. At any rate, we are not justified in saying that it is incomprehensible how definite changes, like those of wing color in the butterfly, are transmitted to the germplasm. They *are* transmitted. Moreover we know that the germplasm does not live the isolated life which the hypothesis of Weismann teaches. The germplasm of the reproductive cells and the nuclei of the body cells are closely inter-related, and it is well known today that both in plants and in animals there exist connections between most cells by means of fine threads of protoplasm. So that we must now consider the close relationship of these cells to one another rather than refer to the isolation of any particular kind. Spencer gives us