

perishable, mortal, doomed, after temporarily serving the purposes of individual development, to disappear from the category of living matter.

And secondly, it appears that the germinal substance or germ-plasma, when once differentiated from the personal substance or body-plasma, cannot, as a rule, perform unaided the function of continuous preservation of the species or phylum. In all the higher animals the germ-substance appears in two distinct seemingly complementary forms, and only by the fusion of these does the development of the germ-substance become possible.

55.
Differentiation of germ plasma.

The great difficulties which stand in the way of applying these conceptions (which have found an exhaustive exposition in Prof. Weismann's 'Essays on Descent and Heredity') to the vegetable kingdom have been pointed out, and have prevented their general adoption by biologists;¹ nor have the elaborate modifications introduced in Prof. Weismann's later writings tended to make them more acceptable; the idea, nevertheless, of a fundamental differentiation of the elements of living matter into germinal and personal has got hold of the scientific mind at the present day, and cannot be

¹ On the objections of Prof. Strasburger, who points to the fact that in the case of begonias the fragment of a leaf planted in moist sand can reproduce the whole plant; of Prof. Vines, who shows that whole groups of champignons, which propagate annually, are nevertheless rich in genera and species, which have evidently descended from one another, see Yves Delage, 'L'Hérédité,' p. 526, &c.; 'Nature,' vol. x. p. 621; also O. Hertwig, 'The Biological

Problem of To-day,' transl. by P. C. Mitchell (1896), p. 40, &c. On the discovery of Weismann "that in parthenogenetic ova only one polar globule is formed, while there are always two in ova which are impregnated," and the "momentary" presumption in favour of his theory which it afforded, see 'Essays on Heredity,' p. 333, &c.; Geddes and Thomson, 'Evolution of Sex,' p. 180, &c.; and Delage, 'L'Hérédité,' p. 151.