

(3) The environment seems sometimes to give the organism what may be called a variation-stimulus. An environmental change may "let loose" a constitutional, congenital, or germinal predisposition to vary in a given direction, or it may stimulate germ-plasm to vary in some new way, the result being manifest in the next generation.

(4) Environmental changes (topographical, climatic, &c.) impose or remove restrictions on distribution and on the range of possible pairing among the members of a species. In other words, the relations of organisms and their environment include isolation and dispersal.

(5) There is the relation of elimination, wherein the environment operates unequally on the members of a species, killing some and sparing others, shortening the life of some and lengthening that of others, inhibiting the reproduction of some and favouring that of others, which is one aspect of the struggle for existence.

Perhaps the most far-reaching word in biology is this word adaptation or fitness. The idea it expresses is familiar to all. Everyone knows of associations of men—whether firms or societies, universities or families—in which the component members pull well together, and are, or become, mutually adapted. Similarly with plants and animals; there is internal adaptation of organ to organ, as of bone to muscle; there are adaptations of the organism to its inanimate surroundings, as the cactus to the desert; there are adaptations of organism to organism, as the flower to its favoured insect-visitors, and the insects to their favourite flowers. The study of bionomics is in great part concerned with these adaptations.

In discussing sex and reproduction in plants, we have briefly noticed the pioneer work of Christian Konrad Sprengel (1750-1816), but he cannot be left out of a chapter on bionomics.

After being ejected from the rectorate of Spandau for neglecting his flock in favour of flowers, he settled down to a frugal life in Berlin, and gave lessons in languages and botany. A back room at the top of a lodging-house was filled with his herbarium, his books,