pale, bulky, with abundance of undigested fat, and showed evidence of putrefactive changes. In the fæces and stools obtained by calomel catharsis from the upper intestine, the normal bacilli, viz. gram-negative forms belonging to the *B. coli communis* and *B. lactis aerogenes* group, appeared absent, while the bacterial elements belonged to the gram positive group, the most constant being one which the author named *B. infantilis*.

As improvement set in there was a gradual return to normal bacterial conditions. The author says that the relation of *B. infantilis* to the genesis of infantilism must be left open, but it is certain that in its most extreme form intestinal infantilism is associated with the persistence and dominance of types of intestinal flora which belong to the period of infancy, and the persistence of which, in the third to eighth year of life, must be regarded as pathological.

The author believes that the cause of arrested development is due to serious defect in the power of absorption and digestion of food-stuffs. In treating these cases he found that drugs, purgatives, and intestinal antiseptics, gave little help. With careful hygienic and dietetic supervision the intestinal disturbance was checked, and gradually, although often with the utmost difficulty, an increase of weight followed.

The observations on which this study is based were of a purely clinical nature, and the deductions cannot be accepted as conclusive, but they are suggestive and interesting, and are presented by an investigator of experience. L. G. A.

PLASTICITY IN PLANTS.

The Heredity of Acquired Characters in Plants. By the Rev. Prof. George Henslow. (London: John Murray, 1908.) Pp. xii+107; 24 illustrations. Price 6*s*. net.

THE object of Prof. Henslow's book is "to prove that evolution—so far as plants are concerned—depends upon the inheritance of acquired characters." "This was Darwin's contention." See, for instance, the summary statement on p. 424 of the sixth edition of the "Origin of Species"! "Present-day ecologists who study plants in nature are all at one in accepting the fact that evolution in plants is the result, not only of a natural response to the direct action of changed conditions of life, by means of which they evolve new structures in adaptation to their new environments, but that these acquired characters *can* become hereditary." The author calls this, for some strange reason, "the true Darwinism." His general argument, which is backed up by many very interesting facts, may be illustrated by taking the following instance:—"A certain plant of a Trichosanthes, happening to have its tendrils touching the wall of the glass frame in which it grew, instantly developed a number of minute pads which adhered to the wall, though such a structure is not known to exist in the cucumber family at all." A common sea-weed, *Plocamium coccineum*, makes similar pads if a tip happen to press against another sea-weed. Mere mechanical force produces through response hereditary structures. In the American Virginia creeper the tendrils form adhesive tips when they touch the wall. These are not hereditary, but the power to form them is. In the Japanese Virginia creeper they are partially developed before there is any contact with the wall. "They are hereditary, but quite useless until contact has taken place, when they at once begin to develop into perfectly adaptive structures. Such is obviously a result of a response with adaptation to a purely mechanical contact of the soma with the wall, and before any reproductive germ-cells exist." As the author says, "botanists have this great advantage; they have *facts* to deal with, and no theories whatever to maintain."

Prof. Henslow's book is of much value in giving fine examples of the plasticity of plants under external stimulus, *i.e.* of the appearance of new features in unwonted conditions. But it is difficult to decide how far the observed change of structure in an individual plant is a direct result of the environmental influence, and how far it is due to the liberation or inhibition of constitutional possibilities established long ago. The author thinks the first view is the correct one, and he points out that similar modifications are exhibited in similar conditions by many quite unrelated plants. As to the heritability of modifications the individual occurrence of which is recognised by all, Prof. Henslow admits that changed plants may at once begin to change back again when the novel stimulus is withdrawn, but he maintains that the acquisition may last long enough to show that it was hereditary. This is a crucial point, and should have been worked out more precisely. The author gives cases like the following:—Lesage made plants, such as garden-cress, succulent, by watering them with salt water; plants raised from seed of the somewhat succulent salted plants were still more succulent in the following year.

The general conclusion of Prof. Henslow's book is that "the origin of species is due to the joint action alone of the two great factors of evolution—*Variability* and *Environment*—without the aid of natural selection; although we are, and are likely to remain, profoundly ignorant of the mysterious process (of *Response*) within the organism by which it is effected."

AGRICULTURAL CHEMISTRY.

Elementary Agricultural Chemistry: a Handbook for Junior Agricultural Students and Farmers. By Herbert Ingle. Pp. ix+250. (London: C. Griffin and Co., Ltd., 1908.) Price 4*s*. 6*d*. net.

TEACHERS at agricultural schools and colleges are placed in the difficult position of having to teach a branch of applied chemistry to pupils who have little time, and often less inclination, to study pure chemistry. The best method of procedure has probably not so far been found, nor has agricultural chemistry as yet fallen into the hands of the text-book writer to anything like so complete an extent as its parents on both sides. It is, however, pretty clear what the agricultural student ought to be able to do. He should have a good working conception of