

different proportions of certain substances, which answer as food for succeeding plants. Some physiologists suppose that the roots of plants absorb soluble matter of every kind from the soil, and that some of this being unfit for the nutrition of the plant, is again thrown out by the roots as excrement. They assert, and they are supported in the assertion by analogy, that no excrement ejected by a plant can be again received into the constitution of that plant, and therefore, that the more such ejected matter abounds, the worse the soil becomes for the particular kind of plant that threw it out. This excrementitious matter, however, may be absorbed as food for a different set of plants; and hence is the great benefit from interchange, or the rotation of crops. LEWIS observes—"A great number of facts appear to give a high degree of probability to this view. Every gardener knows that a fruit tree cannot be made to grow on the same spot where another of the same species stood, or at least, not until after a lapse of several years."

Some plants thrive best when growing beside one another; others, again, prevent the development of those beside them, whence it was concluded "that the beneficial influence in the former case depended on a mutual interchange of nutriment between the plants, and the injurious one in the latter on a poisonous action of the excrements of each on the other, respectively. The experiments of MACAIRE PRINCERS proved that the roots of many plants emitted extractive matter; that the excretions were most abundant during the night; that the characters and properties of the excrements of different plants are different from one another: and that some plants expel excrementitious matter of an acid character, whilst

other plants throw out mild substances. "Theoretical considerations on the process of nutrition, as well as the experience of all agriculturists, leave no doubt that substances are excreted from the roots of plants, and these matters form the means by which the carbon received from *humus* in the early period of their growth, is restored to the soil."

Let us now enquire whether these excrements, thus expelled, are capable of being absorbed as food by other plants.

The excrement of a carnivorous animal contains no nutritious matter for another animal of the same species, but an herbiferous animal, a fish, or a fowl, might find in it some undigested matter, which they could digest, having different digestive organs. Various substances may pass unchanged through the alimentary organs of an animal. These are excrements, and not excretions, and might be digested in the digestive apparatus of another animal. Similar conditions must subsist in the vital processes of plants.

This excrementitious matter undergoes a change, and is eventually converted into a substance, which supplies the place of *humus*, by being a constant source of carbonic acid. The composition of the soil influences the decay of this excrementitious matter. It is quickest in calcareous; and more slow in heavy clay, or loam soils.

"The same plants can be cultivated with advantage on one soil, after the second year, but in others not until the fifth or sixth, merely on account of the change and destruction of the excrements, which have an injurious influence on the plants being completed in the one, in the second year: in the others, not until the ninth.

"In some neighbourhoods clover