

annually the fertilizing media of which by the preceding crop, it has been deprived, that soil, however, rich originally, however largely possessed of those ingredients essential for vegetation, will in process of time, become thoroughly exhausted. This is being manifested in many parts of the United States, and of Canada, and even in many of the dyke and marsh lands of the Lower Colonies. On this exhaustive process may be brought about in another way. If you sow the same crop on the same field for a number of years, without supplying what is abstracted from it—the soil of that field will lose the nutrition necessary for the healthy growth of that crop, and the crop will gradually and inevitably degenerate.

The cause being known, the remedy is apparent. When the land is generally exhausted, a manure must be added which shall contain, and, therefore, convey to it an adequate supply of all the things which all the crops, and all their parts, conjointly, carry off. When it is specially exhausted the addition of one or more of these substances will be sufficient.

This principle throws further light on rotation of crops. It is better to prevent the special exhaustion we have been speaking of than to cure it. It is often difficult to discover what the land really requires and therefore to cure the evil when it exists. The only method of preventing it with which we are acquainted, is by the introduction of a skilful rotation or alternation of unlike crops.

The whole of the preceding remarks may be thus summed up. If the soil does not contain the ingredients required for a crop, they must be added in the form of manure. The principle of manuring is to supply what the plant cannot obtain from the soil, and to render certain matters already in the soil available for nutrition. In order that this may be properly practised, there must be an analysis of the soil, of the plant and of the manure. Hence the importance of vegetable physiology and of agricultural chemistry to the Farmer.

But from the inorganic portion or ash of the plant, let us now turn to that of the animal. The several parts of the animal body leave when burned, a quantity of ashes. This establishes a certain analogy between the plant and the animal. But the analogy is closer than this. For, first, the proportion of this ash, varies in different parts of the animal, as it does in those of the plant. The fresh bone leaves one-half of its weight, when burned, the fresh muscle not more than one-hundredth part, yet, as it is the case with the plant the small proportion present, in the muscle, is as essential to its constitution and healthy existence, as the huge quantity in the bone. The composition of each part is especially adapted to the purpose it is intended to serve.

Of what substances does this ash consist? It contains the same substances as are present in the ash of the vegetable food which the animal eats. There are found in it Potash, Soda, Lime, Magnesia, Oxide of Iron, Oxide of Manganese, Sulphur, Phosphorus and Chlorine. Thus the analogy between the soil, the plant, and the animal, becomes closer and closer at every step.

Looking back for a moment to the plant, we now see not only that all these substances are essential to the growth and existence of the plant, but why they are and must be so.

In adorning and beautifying the earth, plants serve only a subsidiary purpose. It has indeed pleased the Deity to invest them with forms and colours which are grateful and refreshing to the eyes of man, but to impart this gratification is not the purpose or end of their being. Their real function is to prepare and minister to the animal races. Now this function they could not perform unless they contained all that is required to build up the several parts of the animal body. Is it not a beautiful provision, therefore, that plants should be unable to grow, where they cannot procure that which it is their natural purpose and duty to procure for the animal. To the uneducated ear the plant seems to have acquired a voice "I need not grow here; I should be of no use, if I did. I should only cheat the senses of the unsatisfied animal

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