

Starch, when exposed to the action of certain diluting acids, or even water, at a certain temperature, is converted first, into gum and then sugar. In corn and the legumes, the starch is contained in the parts growing above the ground, whereas, in the potato there is none found in these, but only, in the tuber. In the turnip, no starch is found either in tops or root, but in the expanded part of the underground stem which we call the turnip, it is replaced by sugar. On the other hand, the quantity of protein, one of the essential elements of animal nutriment, is small in comparison with that of wheat, oats, or beans ! and yet an acre of a good crop of potatoes produces a greater amount of protein than one planted with any other crop.

If we examine the inorganic structure of the potato we shall find that it differs from other plants by containing a new large proportion of potash and very little soda. The potato resembles wheat and oats in being richer in magnesia than lime, but it differs from all grains and legumes by containing only a small proportion of silica. These peculiarities are chiefly interesting with regard to the manurial substances which are carried off the land by the potato crop, and to serve as a guidance with regard to what crop will best succeed it, and what kind of manure is best fitted to restore the land to its normal condition.

The great productiveness, and facility of cultivation of the potato, have caused it to be spread over large areas, and have made it a staple article of food in many countries, but the very ease and simplicity of its culture and care, have led to abuses and neglect which have rendered the plant more liable to disease ; one of its peculiarities is this liability : we scarcely find any other similar to it in this respect.

The value of potatoes, as food for man and beast, will be estimated high or low, according to our notion of the nutrimental value of starch as a main principle of nutrition : if we regard starch as such, we pronounce potatoes superior to some

grains and all pulse ; but if we view starch as merely an element of respiration and regard the nitrogenous principles as the true formers of blood, membrane, cartilage and muscle we must come to the conclusion that, even dried potatoes, weight for weight with all seed crops, are greatly inferior to them. According to the most recent discoveries, the nitrogenous principles or protein compounds, albumen, casein and gluten, are really the most important, and analysis shows the order of vegetables in which these exist should be placed thus : 1 beans, 2 pease, 3 Oats, 4 wheat, 5 maize, 6 rye, 7 rice, 8 barley, and 9 potatoes. All the subjects which nature presents to us for our nourishment are mixtures and invariably contain a proportion of the nitrogenized matters and the salts required to build up the framework of the body. It is true that, in the potato, the muscle-forming elements are found in small proportions, hence the poor who used to be confined chiefly to a potato diet, ate them in large quantities, and this while securing even more starch than is required, secure a fair quantity of the other nutritive ingredients.

It is a law of nature that any matter, to be useful for the nutrition of the body, must contain some form of nitrogenized material—some albumen as in potatoes, and some gluten as in wheat, or some casein as in pease. As we know that starch can be dissolved in boiling water, it seems strange that in the operation of cooking by boiling potatoes in water, it should not become soluble ; but in the potato, the starch is confined in small separate cells, which also contain a minute portion of albumen, which is operated on by the application of heat in the very opposite direction, curdling, and becoming a firm mass. Therefore, in boiling potatoes, though we dissolve their soluble salts, and expand the grains of starch, yet the hardening of the albuminous matter which lines the cells, confines the starch to its place and prevents its loss and diffusion through the water.

As regards the potato tops, analyses