

## — Outside the Gates. —

## Science Notes.

## DIGESTION IN PLANTS.

WHILE a plant is yet a seedling, and unable to earn its living after the fashion of its mature relatives, it appears to feed more or less on the same matter, and in the same manner as an animal. The organic compounds found in a plant are, in many cases, the same, or similar, to those found in the bodies of animals. The plant, however, has the power of building up such complex compounds from inorganic materials found in the earth and the air, whereas the animal feeds upon the plant, thus appropriating the results of its labours, or the animal may prefer a still more costly method of feeding, and may devour other animals which have been nourished on vegetables.

A fully-developed plant obtains its food from the earth by means of its roots, and from the air by means of its leaves, the green colouring matter of the latter having the power to decompose the carbon dioxide of the air. When the embryo is enclosed in the seed, however, it requires specially prepared food in order that it may increase in size, for until the root and stem elongate, the little plant has no access to the soil or to the light and air. In order to provide for this initial growth, the parent plant lays up with the embryo a store of nourishing organic food, and this it is which renders many seeds, such as peas and beans, so useful a food to ourselves.

When germination occurs, the chemical nature of the reserve food materials undergoes a change. For instance, the necessary supply of carbohydrate is usually stored up in the form of starch which is insoluble in water, but when this carbohydrate is required for the growth of the embryo, it is changed into sugar which is highly soluble and so easily circulated. This conversion of starch into sugar occurs in the process of malting. Barley or other grain is moistened and kept at a temperature favourable to germination until the conversion of starch into sugar has been effected; then the temperature is increased so as to destroy the vitality of the young plants. When an animal partakes of starchy food, the same conversion into sugar occurs, and is the first step in digestion. The saliva and the pancreatic juice both contain ferments capable of inducing this change. But the plant and the animal both require proteid or nitrogenous food as well as carbohydrate, and although the adult plant can manufacture proteids from inorganic substances, the embryo plant and the animal at every age is dependent on ready-made proteids which are produced in the vegetable world only.

Recent investigation has brought to light the fact that the digestion of proteids by the seedling is also carried on in a manner similar to that which is well known in the animal kingdom. The gastric juice of the animal stomach contains a ferment which is active only in an acid solution, and which converts insoluble proteids into soluble peptones. Hence, persons with gastric juice of inferior quality or quantity are supplied with the ferment *pepsin*, as a medicine, or they receive "peptonised" food so as to render the ferment unnecessary. A ferment, active on proteids, and working only in the presence of acids has also been obtained from seedlings, but it has been found that hydro-

chloric acid which is present in the animal stomach is destructive to the vegetable ferment. A vegetable acid, such as oxalic acid, is necessary.

## Notes on Art.

## THE EXHIBITION OF BOOKBINDING AT "THE CAXTON HEAD," HOLBORN.

NOT many, we fear, of the readers of the NURSING RECORD will have found time to visit this peculiarly interesting Exhibition, which consists of seventy-five copies of William Morris's "King Horus." These books were sent out by W. Tregaskis some months ago to binders in all parts of the world, even to those in remote countries. Many of the books received show great excellence of manipulation, all careful work, while some are perhaps too hard and cold in the perfection of their finish; evidently, books must be well loved to be well bound, and we miss a little in some of these copies the feeling of personal love for the books and their covers.

Some of the materials employed are very curious. Among the most unusual are the snake skin from Sydney (3), a gorgeous piece of Madras work in gold embroidery, a painted cover from Teheran (62), a roughly worked "Koran" binding or a Burmese binding of carved wood, one of Canadian buckskin with its moccasin tag of beadwork and ermine tips, a Cingalese silver-mounted cover, and a brown bamboo case from Yokohama—all these are typical works. From England we are glad to find several bindings—from women workers. We feel that their sensitive fingers ought to be peculiarly suited to bookbinding, and that the womanly qualities of precision and patience are most necessary for this charming trade.

Mr. Graham sends an original treatment of scorched leather, worked with hot tools; Mr. Herbert Railton a design on vellum of a graceful figure in fine line drawing, rather severe in its sombre brown and gold; a very excellent design by Miss Prideaux. Miss Edith Bloxan and Mrs. Walter Crane send embroidered covers which appear more suited to larger work—the effect on so small a surface is somewhat clumsy. Miss McColl's design in green morocco (23), and one on white satin (15) by Mrs. Brownlow, complete the list of those bindings contributed by women.

Two beautiful bindings are by Morrell, of London (24 and 25), and R. E. Buckland's copper *repoussé* chased case is very successful. From Shanghai (9) has been sent an embroidered cover in tender green, which is delicately lovely. The most elaborate example has come from Copenhagen (10), with inlaid leathers in many colours, and a most gorgeous effect. The simple vellum cover (56) from Rome is most pleasing. After seeing many bindings with elaborately built-up patterns and wonderful effects, we feel that for most books, simple binding, such as one in buckskin from Montreal, the brown and gold of Miss Prideaux's design, and the vellum from Rome, suits them best; and that a lover of books would prefer a binding that, however perfect it might be in beauty and perfectness of workmanship, was yet soft and sympathetic to the touch; and, above all, the binding should be as subordinate to the book as the frame is to a picture.

We hope that this carefully got together Exhibition of the craft of bookbinding will not be dispersed, but will find its way into a museum intact.

[previous page](#)

[next page](#)