The first of these ferments, ptyalin, is contained in the secretion of the salivary glands; it has the property of converting insoluble starch into soluble, diffusible sugar. The food is not, however, long enough in the mouth for much of this process to take place, although it is an exceedingly rapid one; and saliva is thought to be chiefly useful in that it moistens the food and so assists mastication, whilst its viscid property helps deglutition.

Soon after it is swallowed the food mixes in the stomach with a secretion produced by the glands in its walls, and known as gastric juice. This mainly consists of hydrochloric acid, with the soluble ferments pepsin and rennin (having a special action on the casein of milk), which require an acid medium for their work. Gastric juice has the power of converting proteid matter into peptones by making it soluble and capable of absorption.

On passing into the intestines the food comes into contact with bile, a fluid which has some antiseptic properties, but chiefly serves to neutralise the acid condition of the food, and so help on the work of the pancreatic juice, the soluble ferments of which can only act in an alkaline medium.

Pancreatic juice is indeed a jack of all trades in the business of digestion, for it saponifies and emulsifies the fats which have been already melted by the heat of the stomach, it changes starches into sugars, and by means of the trypoin which it contains converts any remaining proteids into peptones.

During the whole of their passage through the small intestine, food-stuffs are undergoing the above changes and being absorbed into the lacteals and blood-vessels in the walls of the canal. The juices secreted by the glands in the walls keep the contents of the small intestine semi-fluid, but directly they pass the ileo-cæcal valve their character alters, partly through loss of fluid, which is increasingly absorbed by the large intestine, and partly by the action of various bacteria and other organised ferments.

By the employment of heat, certain acids, and other chemicals, we can so far imitate outside the body the natural processes of digestion as to illustrate the changes brought about naturally by the enzimes. We will begin by converting starch into dextrine and then into glucose.

In our last lecture we saw that starch gives a blue reaction when mixed with a weak solution of iodine. We have here some dextrine; on shaking it up with a little water and adding some of our iodine solution, we see that the reaction is a dark mahogany-brown instead of a blue colour. This mahogany-brown is characteristic of dextrine when treated with iodine.

To Change Starch into Dextrine.

Place some ordinary washing starch in a test tube, add cold water and shake it up; the starch will not dissolve until it is heated, when it forms a transparent jelly. Add a little weak iodine, which, by turning the jelly blue, will demonstrate it still to be starch. The blue colour will disappear on heating but reappear on cooling. Add a little dilute $H_2SO_4$, (sulphuric acid), and heat. Have ready six test tubes, each containing a weak solution of iodine. Continue heating the starch and test from time to time by pouring a few drops into one of the prepared tubes until the mahogany-brown appears in the iodine, proving the starch to have become dextrine.

To Change Dextrine into Glucose.

We know that glucose gives no reaction with iodine; bearing this in mind, we continue to heat the dextrine until on testing with iodine no change of colour is produced.

We can prove the contents of our test tube to be glucose by any of the well-known grape-sugar tests:—

1. Add ½ vol. liquor potassæ or liquor sodæ to the supposed glucose, and copper sulphate drop by drop until it ceases to dissolve. On slightly heating, a yellowish-red precipitate will be seen at once if glucose be present. Dextrine and cane sugar do not give this precipitate, or only after very prolonged boiling.

2. Take a little Fehling's solution (alkaline solution of copper tartrate) in a test tube, boil it, if fresh and in proper condition it will retain its blue colour. Add, whilst it is hot, the solution suspected of containing grape-sugar; if any be present, a reddish-yellow precipitate will at once appear.

## The International Council of Nurses.

We are glad to announce that Miss Charlotte Richmond Mill, Matron of St. George's Hospital, Bombay, has consented to act as Hon. Vice-President for India of the International Council of Nurses. It will be remembered that the Council has power to appoint some representative nurse as an Hon. Vice-President to represent a country in the International Council, until such time as a National Council is fully organised, and eligible for membership of the International Council. By this means organisation is stimulated, and valuable information as to the condition of nursing in different countries is available for the information of the Council.

Countries already represented in the International Council are England, Scotland and Ireland, Canada, Federated Australia, New Zealand, Tasmania, India, the United States of America, Germany, Italy, Holland, and Denmark.

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