

## OUR PRIZE COMPETITION.

### WHAT ARE THE CHIEF FUNCTIONS OF THE STOMACH, INTESTINES, LIVER AND PANCREAS?

We have pleasure in awarding the prize this week to Miss E. A. Noblett, 2nd Northern Hospital, Headingley, Leeds.

#### PRIZE PAPER.

*The Stomach.*—The functions of the stomach are to secrete a digestive fluid (gastric juice), to the action of which the food is subjected after it has entered the cavity of the stomach; to thoroughly incorporate the fluid with the food by means of its muscular movements; and to absorb such substances as are capable of absorption.

Gastric juice contains about 0.2 per cent. of free hydrochloric acid, some mucous, and a small quantity of a peculiar substance called pepsin; also a ferment called rennin.

The chief function of the gastric juice is to convert proteids into peptones. The proteids are insoluble and indiffusible bodies, which, when acted upon by the acid and pepsin of the gastric juice, become soluble and diffusible—*i.e.*, they possess the property of passing through animal membrane. Gelatin is dissolved and changed into peptone, as are also chondrin and elastin.

The rennin of the gastric juice causes the casein in milk to clot.

The acid reaction of the gastric juice neutralises the alkalinity of the saliva, and so hinders that of ptyalin. The heat of the stomach melts the fats, and its movements break up the oily fluid into smaller masses, so the general effect of digestion in the stomach is the conversion of the food into chyme. Gastric juice also acts as an antiseptic.

*Intestines.*—The secretion of Brunner's glands is said to be able to convert proteids into peptones, as that of Luberkühn's is believed to convert starch into sugar. Most of the fat is absorbed by the lacteals of the intestine, but a small part which is saponified is also absorbed by the blood vessels. The coarser and undigested portions of food are hurried from the small intestine by peristaltic action into the large intestine, where some absorption of such materials as are still in solution takes place, as undigested matters gradually lose their liquid and nutrient parts, and are converted into soft solid masses, which finally are discharged by the rectum and anus as fæces.

*The Liver.*—The functions of the liver may be classified under the following heads: The secretion of bile and the elaboration of blood;

under this head may be included the glycogenic function.

1. The function of the bile: (a) It assists in emulsifying the fatty portions of the food, and thus rendering them capable of being absorbed by the lacteals; (b) it moistens the mucous membrane of the intestine, thereby facilitating the absorption of fatty matters through it; (c) it has considerable antiseptic power, and serves to prevent the decomposition of food during the time of its sojourn in the intestine; (d) it is considered to act as a natural purgative, by promoting an increased secretion of the intestinal glands and by stimulating the intestines to the propulsion of their contents.

2. Glycogen is formed in the liver from the sugar and proteins which come to it dissolved in the blood-plasma of the portal vein. The liver stores up most glycogen after a meal rich in starch and sugar; but it can make it, though more slowly, from proteids or nitrogenous food.

Stored up in the liver as glycogen much of the sugar absorbed from a meal is intercepted, and prevented from passing too readily into the general blood circulation.

*The Pancreas.*—The pancreas secretes sparingly a colourless, tasteless, and alkaline fluid, usually for two hours after food. It is the most important of the digestive fluids, and contains three ferments—trypsin, steapsin, amylopsin.

Its functions: (a) Trypsin has the property of converting proteids into peptones. All the albuminous or proteid substances which have not been converted into peptone and absorbed in the stomach, and the partially changed substances—*i.e.*, the parapeptones—are converted into peptone by the pancreatic juice, and then in part into leucin and tyrosin. (b) Amylopsin converts the starch into glucose. (c) Steapsin emulsifies the fats and oils, and splits them up into the fatty acids and glycerine. (d) Pancreatic juice possesses the property of curdling milk.

The pancreatic juice practically completes the work of digestion left unfinished by the saliva, gastric juice, and bile.

#### HONOURABLE MENTION.

The following competitors receive honourable mention:—Miss V. A. E. Snowdon, Miss J. G. Gilchrist, Miss C. G. Cheatley, Miss A. B. Owen, Miss H. Walter, Miss E. J. Shepherd, Miss E. M. Braham, Miss V. R. Dawes, Miss M. A. Bigley, Miss H. Kennedy, and Miss M. Hall.

#### QUESTION FOR NEXT WEEK.

What are the causes of constipation in an infant during the first ten days of its life? How is the condition treated?

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