

OUR PRIZE COMPETITION.

MENTION THE FLUIDS SECRETED IN THE BODY FOR THE DIGESTION OF FOOD. HOW DO THESE FLUIDS ACT UPON THE FOOD CONSTITUENTS?

We have pleasure in awarding the prize this week to Miss C. G. Cheatley, Union Infirmary, Lisburn Road, Belfast.

PRIZE PAPER.

The digestive fluids which act upon food in its passage through the alimentary canal are: (1) Saliva, (2) gastric juice, (3) pancreatic juice, (4) bile, (5) intestinal juice.

(1) *Saliva* is an alkaline watery fluid secreted by certain glands (salivary glands), of which there are three on each side of the mouth; the saliva contains a chemical substance which acts upon starchy food and converts it into sugar. This substance is a ferment called ptyalin. A ferment is a substance which is able to act chemically upon some other material, the nature of which it changes without itself undergoing any alteration.

(2) *Gastric juice* is a clear acid fluid, of which many pints are secreted in the course of twenty-four hours. The acidity is due to the presence of free hydrochloric acid, which is secreted only at the cardiac end of the stomach. The main constituent of gastric juice is a ferment called pepsin, which has the property of acting upon proteid food and breaking it up into soluble substances, called albumoses and peptones. Pepsin is secreted at both ends of the stomach, and is formed by the cells lining the tubular glands. It acts only in the presence of an acid. Besides pepsin and hydrochloric acid, gastric juice also contains a ferment called rennet ferment, or rennin, which has the property of curdling milk.

(3) *Pancreatic juice*, secreted by the pancreas, is alkaline in reaction; it finishes the work which the saliva began. It takes hold of the starchy matters which still remain undissolved, and changes them into sugar. It contains three separate ferments, adapted to act on three main kinds of foodstuffs. The ferment which acts on proteid food is called trypsin, and the action which it exerts is very similar to that of the pepsin of gastric juice, only it acts in an alkaline medium and is more vigorous than pepsin, quickly bringing about not only the conversion of proteid into albumens and peptones, but also those more extensive changes which were noted as taking place only after prolonged gastric digestion. The pancreatic juice thus acts on all kinds of food, and it is probably the most important agent in the whole process of digestion.

(4) *Bile* is a bright yellow, bitter fluid with an alkaline reaction, secreted by the liver; probably about 50 oz. of bile are excreted in twenty-four hours. The yellow colour is due to the presence of special pigments formed by the liver cells from the hæmoglobin of the blood, and these pigments reappear both in the fæces and in the urine, to which they give characteristic colours. The exact use of the bile in the digestive process is not certain, but it neutralises the acid of the gastric juice, and also assists in rendering fatty materials ready for absorption by the intestine.

(5) *Intestinal juice* is a liquid poured from the inner surface of the intestines, which, like the saliva, acts upon starchy matters; at the same time, however, this juice aids the digestion of proteids and of fats, thus assisting the other juices. The intestinal juice has the properties of saliva, gastric juice, bile, and pancreatic juice all in one. It is intended to act upon all matters in the intestines still left unaffected by the other juices, so that no part of the food may be wasted.

HONOURABLE MENTION.

The following competitors receive honourable mention:—Mrs. F. Dickson, Miss C. McLennan, Miss L. S. Nunnerley, Miss J. Martin, Miss F. Dunbar, Miss E. M. Streeter, Miss E. Gunn, Miss M. C. Day, Miss L. Tomlinson, Miss A. M. Pollard, Miss L. Harris, Miss G. E. Hinchcliffe, Miss J. G. Gilchrist.

Miss Nunnerley writes:—The *pancreatic juice* is secreted by the pancreas and is conveyed by a duct into the duodenum, where it meets the acid chyme. It acts by turning proteids into peptones, but unlike the gastric juice only in the absence of an acid. The substance contained in the pancreatic juice which brings about this change is called trypsin. It also acts upon fats by emulsifying them, and brings about a minute division of fat globules, thus allowing the fat to pass through the intestinal walls. The juice also acts upon fats so that glycerine is produced. The action of the pancreatic juice upon carbohydrates is similar to that of the saliva.

The intestinal juice is secreted in the walls of the intestines by glands—it acts upon the chyme much as the pancreatic juice, only not so powerfully—it also converts milk into curds.

QUESTION FOR NEXT WEEK.

In what position will a bed-patient suffering from dyspnoea find greatest relief? State all that a nurse may do in devising comfortable support for the patient, and in what ways his position may be changed from time to time.

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