

OUR PRIZE COMPETITION.

WHAT PURPOSES ARE SERVED BY (a) CHYME, (b) CHYLE, (c) PANCREATIC JUICE, AND (d) BILE?

We have pleasure in awarding the prize this week to Miss Rachel Dodd, Woolwich Home for Ailing Babies, 123, Eglington Road, Plumstead, S.E. 18.

PRIZE PAPER.

(a) *Chyme* (Gr. *cheo*=I pour) is the name given to the partly digested food as it issues from the stomach into the intestines. It is very acid and grey in colour, containing salts and sugars in solution, and the animal food softened into a semi-liquid mass. The slow churning movements which take place in the walls of the stomach have the effect of thoroughly mixing the food and gastric juice and, to a certain extent, of breaking up the former. Digestion in the stomach does not prepare the food for absorption, but is intended merely to warm it, thoroughly mix its different constituents, and, by a softening process, convert it into chyme.

It consists of (1) saliva and partly dissolved starchy foods; (2) gastric fluid and partly dissolved nitrogenous foods; (3) undigested fat in the form of minute globules; (4) mucus from the mucous glands; (5) indigestible substances.

The character of the chyme varies considerably according to the nature of the food taken; but it is generally a thick, milky, acid fluid, possessing a disagreeable odour.

This chyme is now ready to leave the stomach, after which it is acted upon by bile and pancreatic fluid converting it into a yellowish fluid called chyle.

(b) *Chyle* is the name given to the partly digested food as it passes down the small intestine, and also to that part of it which is absorbed by the lymphatic vessels in the intestine. The absorbed portion consists of fats in very fine emulsion, like milk, so that these vessels receive the name of lacteals. This absorbed chyle mixes with the lymph, and is discharged into the thoracic duct, a vessel as large as a quill, which passes through the chest to open into the jugular vein, on the left side of the neck, where the chyle mixes with the blood, whence it reaches the right side of the heart, and is then forced into the lungs for aëration. The oxygenation of the chyle supplies the needed nutrition of the entire system.

(c) *Pancreatic Juice* (fluid resembling saliva) which is formed by the pancreas, and which is poured into the small intestine after the partially digested food has left the stomach. This

is the most important of the digestive juices, is alkaline in reaction, and contains, in addition to various salts, four ferments—(1) Trypsin, which converts into soluble substances proteid bodies; (2) Amylopsin, which completes the digestion of starchy foods and other vegetable substances, rendering them fit for absorption; (3) Steapsin, which converts fats into an emulsion, changing them partly into glycerine and fatty acids ready for absorption; and (4) a ferment that curdles milk. This juice is the only digestive fluid which acts on all kinds of food.

(d) *Bile* is a thick, bitter, golden-brown or greenish-yellow fluid, secreted by the liver, and stored in the gall-bladder. It consists of water, mucus, brown and green pigments, salts, and two complex acids, and some mineral salts, and it is discharged through the bile-ducts into the intestine, a few inches below the pyloric opening of the stomach.

This discharge is constant, but is much increased shortly after food is taken, and again some hours later, when the food is digested.

The chief uses of bile as a digestive fluid are:—(1) To assist in emulsifying fats; (2) to moisten the mucous membrane of the intestine; (3) to aid the absorption of nourishment from the food passing down the bowels; (4) to prevent excessive decomposition and smell; (5) to act as a natural purgative by assisting the muscular motions and the secretion of the intestines; (6) appears to destroy poisonous products from the bodily activity, or from the food, but when this is poor or small in amount they are re-absorbed with it.

HONOURABLE MENTION.

The following competitors receive honourable mention:—Miss R. E. Salt Cox, Miss H. Ballard, Miss P. Thomson, Miss O. M. Billinghurst, and Mrs. G. Firth Scott.

Mrs. G. Firth Scott writes:—"The bile is stored in the gall-bladder, which is a small bag from 4 to 5 inches long and $1\frac{1}{2}$ inches wide, lying under the surface of the liver. The duct from the gall-bladder joins the bile duct of the liver, and the bile-duct and pancreatic juice flow into the intestine together. In certain disorders bile is found in the urine. A typical 'bilious attack' indicates a superfluity of bile, and should be counteracted by a saline purge or by calomel followed by saline."

QUESTION FOR NEXT WEEK.

Give the most interesting Report of Second Sight you have experienced, or of which you have been told.

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