OUR PRIZE COMPETITION.

WHAT IS BLOOD? WHAT IS ITS COMPOSITION? WHAT CAUSES IT TO CLOT?

We have pleasure in awarding the prize this week to Miss Bertha Priscilla Wiltshire, Children's Hospital, St. Michael's Hill, Bristol.

PRIZE PAPER.

1. Blood is the red fluid which circulates through the arteries, capillaries and veins, exchanging fluid and gases with the bodily tissues.

The chief uses of the blood are as follows:—

1. It contains the products absorbed from the foods, and conveys nourishment to all parts of the body.

2. It contains secretions needed for the general purposes of the body, prepared by such glands as the thyroid gland and the suprarenal bodies.

3. It removes from the tissues various waste products, such as carbonic acid gas, to be exhaled by the lungs; and urea and salts to be removed by the kidneys.

4. It serves to distribute heat throughout the body.

2. The blood is composed of a colourless alkaline fluid called Liquor Sanguinis or Plasma, in which float a great number of red corpuscles, and a smaller number of white corpuscles. The corpuscles give to the blood its colour and consistency. In the blood are dissolved the proteids which nourish the tissues—*e.g.*, serum albumin and serum globulin; it also contains Fibrinogen, or the element of Fibrin and Thrombin, the ferment or katalitic agent present in the blood. Fibrinogen upon exposure to the air, and through the influence of the thrombin, coagulates and forms fibrin.

The red corpuscles or erythrocytes act as the oxygen carriers in the blood, each is a circular bi-concave disc; they have no nucleus, and are fairly rigid.

They contain a substance called Hæmoglobin, which acts as a medium of exchange between the oxygen of the air in the lungs and the tissues requiring it.

Hæmoglobin is a chemical compound containing the element iron, it forms when combined with oxygen, oxyhæmoglobin. The colour of the blood is due to the hæmoglobin present in the red corpuscles.

The white corpuscles or leucocytes are composed of a mass of living tissue called protoplasm, in the centre its substance becomes denser, and forms a nucleus.

The white corpuscles much resemble the lowest form of animal life, the Amœba; they also, like the Amœba, are capable of constantly pushing out irregular processes, and ingesting foreign bodies, and are, therefore, said to be capable of "amœboid movements."

The leucocytes are able to pass through the porous walls of the capillaries into the tissues; here they perform several functions, the chief of which are the healing of wounds, the ingestion of foreign bodies, and the destruction of bacteria; their dead bodies form when in large quantities the matter or pus of abscesses.

The number of white corpuscles is one to five hundred of the red corpuscles.

There are two varieties of leucocytes; they are those with a single large nucleus (mononuclear) and those with a nucleus consisting of several different shaped parts (polymorphonuclear).

The leucocytes having a polymorphonucleus are called phagocytes; these are engaged in engulfing and destroying bacteria.

Phagocytes are called the blood scavengers.

The red and white corpuscles are constantly wearing out in the course of their ceaseless activities, new red blood cells are formed in the interior of the small hollow bones, in the red marrow that fills the cancellous tissue; some of the white cells are derived from the lymph glands, others are formed in the red bone marrow.

Clotting of the blood occurs when the blood is exposed to the air, and is due to the formation of threads of fibrin, which is a solid substance produced by the action of the ferment thrombin upon the fibrinogen, the threads of fibrin form a network in which the corpuscles are entangled.

As the clot of fibrin and corpuscles increases in density a clear fluid called serum is left.

This clotting of the blood is the chief natural defence against death from continued hæmorrhage.

HONOURABLE MENTION.

The following competitors receive honourable mention: Miss Marjorie Pack, Miss L. D'Oyley Watkins, Miss Adeline Douglas, Miss Dorothy Jean, Miss F. N. Cotter, Miss P. Thompson, Miss H. E. Inglis.

Miss D'Oyley Watkins writes:—"When in the body fibrinogen in the blood is in solution, but when blood is shed a ferment is formed from broken white corpuscles. This ferment changes the fibrinogen into fibrin which coagulates. Fibrin is a soft elastic substance, and during the shedding of blood the corpuscles become entangled in it."

QUESTION FOR NEXT WEEK.

Give instructions how to clean a bathroom.

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