OUR PRIZE COMPETITION.

HOW DOES WATER BECOME CONTAMINATED? WHAT DISEASES MAY FOLLOW THE DRINKING OF IMPURE WATER? MENTION THE PRINCIPAL METHODS BY WHICH WATER MAY BE PURIFIED.

We have pleasure in awarding the prize this week to Miss E. A. Noblett, London Homœopathic Hospital, Great Ormond Street, W.C.1.

PRIZE PAPER.

Water is the prime necessity of life, and its natural sources are the rain and the snow which fall on the surface of the earth. Rain as it leaves the clouds is water pure and simple, free from all foreign ingredients. In its passage through the air to the earth it may collect various impurities, gaseous and suspended; also the rain washes out of the air countless bacterial and fungoid organisms and their spores; the greater number of these organisms are micrococci.

The rain which falls in the impure smoke and soot laden atmosphere of large towns is unfit to drink; it has absorbed the sulphurous and the sulphuric acids of coal and coal gas, and contains numerous sooty particles. When roofs are used as collecting sources for rain water it is liable to be much polluted with soot, vegetable matter (leaves), and animal matter (excrement of birds, &c.), washed off from the slates or tiles.

Rain water should always be stored in as pure a condition as possible, otherwise the storage receptacle becomes coated with foul matters which contaminate the water. Cisterns of lead, iron, and zinc should not be used to store soft water, owing to its liability to dissolve these metals. The same cistern should not be used to flush water-closets as well as to supply the drinking water; the water is in danger of being polluted by sewer air, dust, soot, and accidental contaminations, such as dead mice, birds, or cockroaches.

Waters collected from upland surfaces are liable to pollution from shepherds' huts and the droppings of animals allowed to feed upon the collecting area.

Streams and rivers in their course through cultivated valleys, with towns and villages on their banks, furnish water which must always be regarded as dangerous for drinking purposes; they are subject to pollutions of animal origin. The surface and the subsoil drainage from manured land under cultivation, the sewage effluents from isolated houses, the slop waters and the sewage of villages and sometimes even of towns, and the waste products of industries on their banks, frequently flow into the river.

The waters of many shallow wells may become grossly polluted after a heavy rainfall. The heavy rain washes foul substances in the soil, derived by soakage from manure-heaps, middens, privies, leaky drains, or cesspools, direct into the well.

Diseases Caused by Drinking Impure Water.

(1) Diarrhœa.—Suspended matter will cause this by mechanical irritation of the intestines.

(2) Dysentery.—This is produced by drinking water which has been fouled by fæcal discharges from dysenteric patients.

(3) Enteric Fever.—This is spread by drinking water which has been fouled by the discharges from patients suffering from this disease.

(4) Cholera.—This also is spread by drinking water fouled by discharges from cholera patients.

(5) Dyspepsia is sometimes caused by the presence of mineral matter.

(6) Parasitic diseases may be produced by the eggs or embryos of parasites being taken into the body with water.

(7) Metallic poisoning may be due to lead, arsenic, copper, or zinc in water.

The Purification of Water.

The purification of water on a large scale is usually effected by sand filter beds.

Domestic Filters.—The two most satisfactory are the Pasteur Chamberland and the Berkefeld filters, both of which may be relied upon.

Other methods of purification are: Boiling, distillation.

HONOURABLE MENTION.

The following competitors receive honourable mention:—Miss Marian Gillam, Miss Mildred Corner, Miss Amy Phipps, Miss M. M. Cornock, Miss M. M. G. Bielby, Miss Henrietta Ballard.

Miss Marian Gillam writes concerning an intermittent supply:—Water cut off for several hours produces a vacuum, hence noxious gases and liquids can enter through cracks and imperfect joints; when the water supply is again turned on the impurities are carried along in its stream.

QUESTION FOR NEXT WEEK.

What do you understand by hyperpyrexia? State in full the different methods which might be adopted to control it.

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