

their ability to live in a great variation of temperature. Only a small proportion of organisms are pathogenic or disease-producing. These organisms act, not by their mechanical presence, but by the formation or production of poisonous substances or toxins, which become absorbed into the blood and are thus carried to all parts of the body. Some of the most important pathogenic organisms discovered are those of tubercle; anthrax; tetanus; typhoid; diphtheria; cholera; plague; and the suppurative diseases. Functions of bacteria other than disease-producing are putrefaction, breaking up of dead, used tissues into elements, that they may be used in formation of new life. Fermentation, closely allied to decomposition, *i.e.*, fermentation of milk, in which the alkaline reaction becomes changed to an acid through the action of the organism "bacilli acidi lactici." Chromogenesis or production of colour, causing phosphorescence, the luminosity produced by organisms, and seen in very blue lakes, such as Geneva.

HONOURABLE MENTION.

The following competitors receive honourable mention:—Miss Elizabeth Brodie, Miss W. D. Maton, Miss Mary Onions, Miss Doris Saddington, Miss Jane Carter, Miss E. H. Gibert, and Mrs. Farthing.

Miss E. Brodie writes:—"Saprophytes, which grow on dead organic matter, and are for the most part non-pathogenic, may be regarded as the friends of mankind.

"It is through their activity that dead bodies and other complex organic materials are broken up and returned to the dust. Thus is the earth rid of its carrion, and at the same time vegetation, upon which man and the higher animals depend, supplied with the necessary elements for its growth."

Miss W. D. Maton tells us that bacteria are always present in cases of wound festering, fermentation, putrefaction, and decomposition, and being so minutely small they are believed to exist when they cannot be seen even through the most powerful microscope. A "micron" (a 25,000 part of an inch) is the measure used in taking the sizes of bacteria, and one of the largest known, the tuberculosis bacillus, is only from three to five microns in length.

Miss E. H. Gibert, writing of spirilla, says: "Spirilla are long, wavy, thread-like organisms, the most important of them being the *spirochaete*, known best in connection with syphilis. Each micro-organism consists of a mass of protoplasm, encased, and can be artificially cultivated, either in broth, specially pre-

pared glass plates or tubes with agar, or blood serum, and exposed to the heat most suitable for the growth of each kind.

Groups of these minute creatures are called "colonies," and find their food by breaking up the tissues which have provided them with so comfortable a home. This condition of breaking up we call *sepsis*.

If the growth is allowed to go on in an uninterrupted manner trouble follows, and the person's life is in danger.

A poisonous fluid called "toxin" is produced by the bacteria, and if this is allowed to be distributed in the blood the next stage is called *toxæmia*, and if local changes are produced, then it is called *pyæmia*. There is still hope for the patient if this should occur, but if the condition of *septicæmia* is allowed to become established the patient has less hope of recovery, as it means that not only has the toxin been carried into the blood-stream, but that it is being carried all over the body, and that germs are being reproduced at the same time. If, on the other hand, the power of resistance by the body is greater than the power of manufacturing toxin by the bacteria, these conditions will be overcome, and nature herself in some cases can provide the overwhelming forces in the shape of the *leucocytes*, or white cells of the blood, and it is when leucocytes form an antidote to toxins that we get the production of *antitoxin*, so largely used nowadays. If the leucocytes become overpowered themselves they die, and we call their dead bodies *pus*.

QUESTION FOR NEXT WEEK.

Say what you know about war wounds.

MONEY WELL SPENT.

It was reported at the recent quarterly Court of the London Hospital that in regard to the salvarsan treatment for venereal disease, for the sum of £3,000 the hospital had to treat all patients, whatever their station in life, who might present themselves, examine specimens sent and report upon them, give doctors full and free facilities for learning how to treat the disease, and how to inject salvarsan, and provide the latter free of charge to outside doctors if patients preferred to be treated by their own doctors.

A MUNIFICENT BEQUEST.

The late Dr. John H. Bartlet has left the munificent sum of £200,000 to the East Suffolk and Ipswich Hospital for a Home of Rest for Convalescent Patients.

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