2,000,000 IN ONE DROP.

That Number of Bacteria Found in a Globule of Sour Milk.

Small, But Quite Capable of Doing a Great Deal of Mischief.

How They Are Bred for Scientific Purposes—Study of Their Life History—Where Found.

[Written for THE HELENA INDEPENDENT.]

BACTERIA ARE SUCH LITTLE things—2,000,000 of them can be found in a single drop of sour milk—that it is wonderful what a big part they play in the world.

Bacteria are vegetable, and under the microscope they are found to be of different kinds. Some are rod-shaped and are called "bacilli"—meaning "little rods"—on that account. Others look like corkscrews, while others yet have the form of balls. There are thousands of species, and some of them, when they get into people's bodies, feed upon the tissues and produce such diseases as consumption, pneumonia, diphtheria, scarlet fever, cholera and carbuncle.

But it is only a few bad kinds of bacteria that do such mischief. Most of them are quite harmless, while some of them are so beneficial that the world could not very well get along without them. It is they who dispose of dead animal and refuse vegetable matter by preying upon it and thus reducing it to the useful elements of which it was originally composed. The process called "rotting" is their work, in fact. Different species make fermentation, raise all the bread, turn wine or cider into vinegar, curdle milk or produce an acid which renders it sour, and give to butter its flavor. It is lucky that so few of them are injurious, because they swarm everywhere. The air is full of their invisible myriads.

The harmless bacteria can be safely left to take care of themselves. It is the bad ones which science is trying to find out about, in order to discover how they may be fought against successfully.

The easiest way to study bacteria is by breeding them in the laboratory and observing how they act under various conditions. Beef soup, boiled down to a jelly, suits them first-rate as food; so a small quantity of it is put into a glass bottle and corked. Then the glass bottle containing the jelly is heated until no life of any sort remains in it. Next, the cork is taken out and the jelly is touched with a particle of diseased flesh taken from an animal which has died of diphtheria, say. Of course, that diseased fragment is filled with the bacteria which produced the complaint. Some of them are thus transferred to the jelly and at once begin feeding upon it, multiplying so rapidly that within twenty-four hours there are hundreds of thousands of them in the bottle. A single one of them if it got into a cut in anybody's throat, would make the person sick with diphtheria.

It is the same way with other diseases produced by these vegetable germs. There is a particular species that causes each one.

If the bacteria of consumption, for example, get a lodgment in the lungs, they feed upon the tissues of those organs and destroy the air-cells of which they are composed, multiplying continually and breaking down the parts until the patient dies.

At the Army Medical Museum in Washington there is, on a shelf, a small case holding a dozen bottles which contain, in the shape described, an equal number of the worst fatal diseases known to mankind. The physician in charge kindly offered to give them all to the writer in half an hour.

The breeding of these bacteria is only the first step in the study of their life history. Having thus got a quantity of a certain known species, the next thing is to study and learn how they do their disease-making work, and for this purpose rabbits and guinea pigs are made to serve a useful turn to medical science. For the benefit of mankind these unlucky little beasts are given all sorts of horrible complaints by squirting water containing the germs into their bodies with a syringe. From the time they are made sick in this way to their death, or recovery, they are kept in confinement and studied, or else they are killed and dissected.

Many of these seemingly cruel experiments have an object of much greater importance to us than mere study of the lives and habits of dangerous bacteria.

It has been found that these little parasites, while feeding, produce a poisonous substance. Each species thus makes its own peculiar poison, which can be got in a pure state by the art of chemistry. Once obtained, the poison can be diluted with water and squirted with a syringe into the body of a beast or human being. Used in this way it seems to have the marvelous effect of making the person or creature operated upon safe from catching the disease. Rabbits, after being thus treated or inoculated with diptheria poison, do not take diptheria when inoculated with the bacteria of that complaint. It is the same way with other diseases, the poison of each producing immunity from the trouble itself. Not only is this true, but these poisons appear to act to some extent as cures for complaints in their early stages. Koch's "lymph" is a preparation of consumption poison. All this is a very new discovery, but think of the value it may have some day to the human race!

It has been found out very recently that bacteria attack plants also. They are responsible for not a few of the diseases which farmers call "blights," causing the leaves to wither and the fruits to shrivel. The government keeps up a plant-hospital in Washington, where vegetable patients of all sorts are made sick by spraying them with disease germs. These latter are obtained by breeding the bacteria from diseased leaves on beef jelly. The hospital is a greenhouse, devoted to the study of sick plants, which are all burned finally, lest they spread contagion.

Only very recently has it been found out that vegetables which bear pods, such as peas and beans, depend largely for their productiveness upon bacteria. These microscopic organisms enter their roots and form upon them wart-like lumps. They gather nitrogen from the air and feed this important nutritive material to the plants. Each kind of pod-bearing plant has its own species of bacteria to serve it in this fashion. Accordingly, after the matter has come to be somewhat better understood, it is probable that the farmer will be able to make his beans and peas produce much more plentifully by inoculating them with a sprinkling of earth which contains the proper sort of bacteria in abundance.

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STOCKHOLDERS' MEETING—IN ACCORDance with a resolution adopted at a meeting of the board of trustees of the Montana & Idaho Mining & Reduction company, held this day, a special meeting of the stockholders of said company is hereby called, the same to be held at The Helena hotel, in the city of Helena, Montana, on Tuesday the 17th day of May, 1892, at 10 o'clock a. m.

The object of such meeting is to devise ways and means to raise funds to pay off the debts and liabilities of said company, including advances made and to be made by various parties and stockholders for the benefit of said company by any of the methods hereinafter mentioned, or by any two or more of them, to-wit:

To authorize the board of trustees to sell four thousand shares of the capital stock of the corporation now held by James Kasson as trustee, and commonly known as treasury stock.

Also to authorize the board of trustees to sell all the interest which the company has in that certain patent for an invention which was assigned to the company by W. L. Austin, on the 11th day of August, A. D. 1890, and especially the interest in said patent right which the corporation has obtained in and for the territory of Idaho.

Also to authorize the board of trustees to hypothecate and mortgage the whole or any part of the property and assets of the corporation to raise funds for the purpose above mentioned.

The property so proposed to be sold or mortgaged consists of the patent right aforesaid, sometimes called the Austin patent, in which the company owns an exclusive right for Montana and Idaho, also all the leases, rents, rights, franchises and royalties growing out of the same in which the company is interested; also certain tools, coal, ore and other personal property recently in use at Toston, Montana, a more particular description of which can be obtained by applying to W. B. Lorentz, superintendent at Toston, Montana.

The object of such meeting is also to elect a board of trustees and to transact such other business as may be lawfully transacted.

The books for transfer of stock will be closed for twenty days prior to May 17, 1892.

A. G. POSLEUTHWAITE,
JAMES KASSON,
N. C. THRALL,
GEO. O. NETTLETON,
E. B. NORTHROP,
Trustees.

E. B. NORTHROP, Secretary.

Dated this 26th day of March, 1892.

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