

HEALTH AND SAFETY SECTION**MAN'S DEADLIEST FOE***Cholera Germs*

to end would be less than an inch long, he would probably tell you that you were not speaking the truth. "Don't I know," he would say, "that an evil spirit has brought this upon me?"

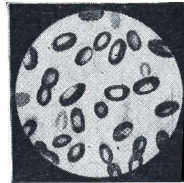
No magician or witch-doctor ever thought of a creature half so startling as a microbe, a form of life so small that it cannot be seen by the unaided eye, yet it claims more victims than all wars, fires, floods, earthquakes, and other deadly agencies put together.

Most diseases, we now know, are due to the presence in the body of exceedingly tiny vegetable or animal organisms which produce poisons that attack the system. These poisons interfere with the functions of the body, cripple or destroy its various organs, bring about decay, and often death. This is believed to apply to nearly all diseases in men, beasts, and even trees and plants, although the germs of some diseases have not yet been discovered.

We must remember that the world all

about us—soil, air and water, plants and animals—is filled with millions of invisible living beings called micro-organisms, from the Greek word *mikros* meaning small. These may be of the vegetable type, called bacteria, or of the animal type, called protozoa. The great majority of these creatures are not harmful to man, even aiding him in many useful ways.

But others start a work of destruction as soon as they enter the human body, in the air breathed into the lungs thru the nose, with the food we eat, or through pores or cuts in the skin.

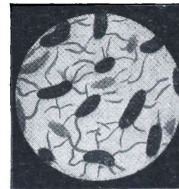
*Germs of Bubonic Plague*

These are disease germs. In ordinary medical speech they are all grouped together as bacteria. They are divided into *bacilli* (rod-shaped), *cocci* (round), and *spirilla* (corkscrew shaped). The term "microbe" is a popular name for all bacteria.

The existence of micro-organisms has been known for a long time, but it was not until the middle of the 19th century that their

activity in producing disease was established.

And scientists have isolated, one by one, the bacteria of blood-poisoning, erysipelas, cholera, typhoid fever,

*Germs of Typhoid Fever*

bubonic plague, pneumonia, meningitis, influenza, yellow fever, diphtheria, tetanus (lock-jaw), tuberculosis, leprosy, whooping cough, and a score of other diseases.

Among the principal ailments which have been traced definitely to animal organisms (protozoas) are malaria, amoebic dysentery, sleeping sickness, and others.

Disease germs do their deadly work by forming poisons or "toxins" in the system. The symptoms of a disease depend upon the nature of these poisons, and the positions in the body occupied by the germs which generate them. Some germs remain in the blood stream, which carries their poisons to all parts of the system. Others seek out special organs like the lungs, the stomach, the liver, the intestines, and the effects of their poisons are felt most powerfully in these localities. Certain toxins, like those of hydrophobia, attack principally the nerves, spinal chord, or brain.

Probably the greatest benefit resulting from the discovery of the germ theory was the fact that it solved most of the mystery of how diseases spread. By studying the habits of the germs, scientists discovered how they grow, how they travel from place to place, and how they enter the human body. They learned that few disease germs can live long in the open air and sunlight, but that many thrive, like the typhoid bacillus, in impure water and milk, or like cholera germs, in various kinds of food which have been exposed to infection. It was found also that the meat of diseased animals often carries bacteria.

The entrance of many other microbes has been traced to cuts and scratches in the skin; this is true of the micro-cocci of

blood-poisoning and erysipelas. In many of the so-called contagious diseases, like diphtheria, germs may be transferred by clothing or anything which has come in personal contact with one who has the disease.

Perhaps the most amazing of all these discoveries was that many deadly germs enter the body through the bite of insects. Malaria and yellow fever, for example, are carried entirely by certain types of mosquitoes. Sleeping sickness—found in Africa—is carried from a person by a certain kind of fly. Bubonic plague—often present in China—is transferred to human beings by fleas which have bitten diseased rats. Typhus fever, which scourged some of the war-ridden countries of Europe so terribly during the first World War, is carried by body lice.

While the danger from germs of all kinds must be carefully considered by persons who wish to avoid disease, this danger should not be exaggerated. Not every disease germ which enters the human body actually causes trouble. In the blood and tissues of all healthy persons there is a tendency to resist and destroy unwelcome germs. Many persons are immune to certain diseases; the germs can get no foothold in them. It is when the body is allowed to weaken through bad habits, overwork, improper food, insufficient exercise, etc., that microbes find themselves able to launch their deadly work.

There are three ways of fighting the diseases caused by germs: (1) by the general destruction of the germs; (2) by preventing them from entering the human body; (3) by overcoming their evil effects after they have made their way in. The first of these methods is usually carried

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about 1500 B. C. In the wall paintings of the dainty little temple one may read her whole story from birth.

Before the Egyptian empire fell, it flared up in a blaze of glory under Remeses II, the most famous of the pharaohs. For a long distance along the Nile the name of Remeses II appears upon almost every building. He was the greatest builder of all the rulers of Egypt, but he put inscriptions upon many buildings erected by his ancestors.

Rameses II reigned for 67 years, from about 1292 to 1225 B. C., waging long wars in Asia which restored much of Egypt's lost prestige there. He may have been the pharaoh who so grievously oppressed the Israelites, as we read in the Bible.

But now the time came when Egypt was to be the conquered country instead of the conqueror. Egypt was subdued by the Assyrians in the 7th century B. C. and by the Persians in the 6th. It remained a Persian province until 332 B. C., when Alexander the Great seized it. Under the descendants of Alexander it was ruled as an independent country. The city of Alexandria became the greatest commercial port on the

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DEADLIEST FOE

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on by sanitation, which strives to do away with the breeding places of germs by disposing of sewage and garbage, by keeping water supplies free from contamination, and so on. The second method is carried out by keeping the body clean, by using disinfectants in wounds, by the proper care of the mouth, nose, throat, by boiling drinking water or using pure water, by fumigating sick rooms, etc. The last method includes the whole field of curative medicine and surgery, with particular emphasis on vaccine and serum treatments, and the use of certain drugs.

Despite all that has been done to solve the problems of medicine since the discovery of disease germs, there still remains an immense field for the scientist to explore. Almost every month a microscope, focused on a spot no bigger than the head of a pin, uncovers some life-saving secret, and the world knows no greater heroes than the men who devote their lives in obscure laboratories to the battle against man's deadliest foe—the microbe.

REVIEW QUESTIONS

1. What living things cause most of the diseases

we know?

2. Why can we not see these organisms with the eye? How many of them, placed end to end, would be less than an inch long?

3. Do savages believe in germs? What do they think causes diseases?

4. Are all micro-organisms harmful to man? Can you name some that are not?

5. What are bacteria? Name the two general groups of bacteria according to shape.

6. Name as many diseases as you can that are caused by bacteria.

7. What product do germs form that is poisonous to the system? What is the meaning of "toxin"?

8. How many germs, or microbes, enter our system?

9. Is every disease germ that enters the human body actually harmful?

10. What are the three ways of fighting diseases caused by germs?

11. Is the man who dies for his country on the battlefield a greater hero than the man who labors painstakingly in a laboratory in an effort to conquer man's deadly foes, the germs?

12. Do scientists know everything possible about disease germs?

13. What are disinfectants?

14. Are they useful? Why?