

Perspective

Bacteria—Friends or Foes

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IF YOU SHOULD STEP OUTSIDE YOUR HOME, after reading this, and pick up a lump of earth, you would hold in your hand millions of living bacteria.

In that piece of soil, plus the bacteria, you would hold some of the secrets of the world's most important process—the production of food, upon which our lives depend. Crumble that lump of soil and let it slip through your fingers, or toss it away as just a piece of dirt—and you'll be missing a chance to explore a wonderful mystery. But, study that soil and examine the bacteria under a powerful microscope—and you'll begin to understand something of the tiny but powerful forces at work in the ground beneath our feet. . .

Agricultural bacteriology—that is, the direct application of the study of bacteria to farming and food growing and processing—began just about 50 years ago. So when you make a study of those millions of microorganisms in that piece of soil you pick up, you are entering a relatively new branch of science, but one that's fundamental to all life on the earth.

Of course, the real agricultural bacteriologist is the intelligent farmer. He is the man who puts into practice the findings of the laboratory. He manages the soil and controls the bacteria. He makes the friendly bacteria work for him and he kills off or holds back the harmful ones. He knows he must grow two crops—a crop of green plants above the surface and the crop of bacteria below. Those green plants which the farmer grows take materials from the soil and the air and energy from the sun, and convert them into food for man and the animals. But it's those tiny organisms in the soil which regulate the kind and size of the crop of green plants. They determine in large part whether we, the people of this world, are well fed or hungry.

The harvest of plants each year may vary in total amount, but there's one fact we all ought to remember,

and it's this: the world's supply of materials upon which the plants themselves feed is fixed and unchangeable.

Nothing we can do will add to the world's total supply of nitrogen, phosphorus, sulfur, carbon, and water. However, we can control the forms available to plants, and we make use of our bacterial friends in the soil. . . .

The men who practice agriculture today go far beyond the mere growing of crops. They, or those who handle their wares, engage in industrialized activities dealing with the processing of farm products—as in the preservation of foods by dehydration, canning, and quick freezing—or the making of butter, cheese, and similar foods. And in all these processes, as we have already said, bacteria play an important part. Canning fruit, for example, is chiefly a matter of killing or controlling bacteria. Otherwise, a can of peaches on your pantry shelf might explode with a loud report and splatter spoiled fruit all over the ceiling.

The quality and flavor of your favorite cheese are the result of bacterial action. And the concentrated foods—the K rations and other forms—which sustained our fighting men overseas when they were beyond the reach of fresh foods—all these were possible only because we have learned to control certain forms of bacteria.

But we have really just begun. There are still countless hidden mysteries to be solved in the field of bacteriology; there is still a great deal more to be learned about these microorganisms which are all about us and which touch our lives so deeply.

The war gave us a graphic lesson in the importance of science and research. May we never forget that lesson. May we remember always that the world is engaged in a race between education and chaos. Education must win. (*These excerpts from "The Scientists Speak" reproduced by permission of copyright owner. Copyright 1947, New York, N. Y., U. S. Rubber Co.*)