

BIOLOGY

Basic Life Stuff Described

Protoplasm, the stuff that makes things alive, was described by Dr. Robert Chambers, professor of microscopic anatomy at Cornell Medical School, in a lecture at the Manhattan Trade School. Rapid advances are being made in our understanding of the chemical and physical foundations of life, the speaker said, and every day the secrets that lie in the living cell are more intimately penetrated.

Protoplasm, as Dr. Chambers described it, shows itself under the microscope to be a clear, colorless material, sometimes viscidly fluid like the white of a raw egg, sometimes firm and jelly-like. But whatever its state, it always shows three properties so long as it is not dead: it grows, it moves, it can "feel"—that is, it can respond to stimuli. Nothing that is not alive can do any of these three things.

Although protoplasm is necessarily present wherever life is present, it is divided into such tiny masses, each within a cell wall, that it cannot be collected into large quantities for ordinary chemical analysis without killing it, when it would, of course, no longer be protoplasm at all. It is therefore necessary to carry on all researches on it by means of powerful compound microscopes. Because of this limitation on research into the properties of living matter, scientists could learn nothing at all about it until the microscope was invented, and that occurred only as recently as the seventeenth century. It has, therefore, come to pass that gross physiology, which deals with the activities of the body in general and can be studied with the naked eye, aided by ordinary chemical and physical apparatus, got a much earlier start than microscopic physiology, which pries into the secrets of the tiny particles of protoplasm themselves. This situation, however, is rapidly being changed, for the science of microscopic physiology, especially during the last half of the nineteenth century and the first quarter of the twentieth which has just ended, has been making great strides to overtake its older companion.

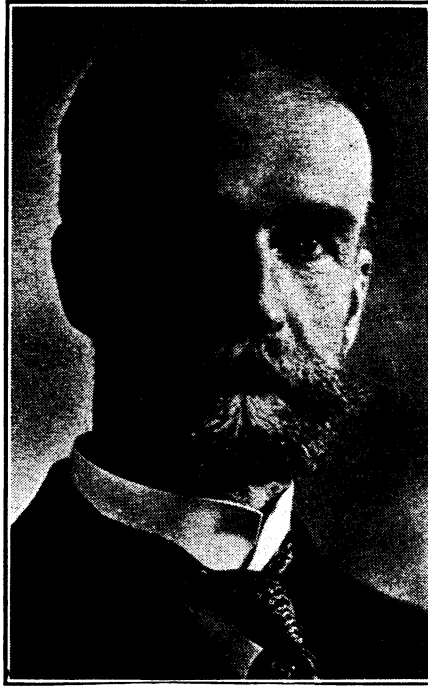
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Women of the Iroquois tribe held office as chiefs.

The shipworm uses the edge of its shell as a boring tool.

Electric motors in the United States do as much work in a day as 170,000,000 men.

BACTERIOLOGY



THEOBALD SMITH

Pioneer Disease Detective

Of the discoverer of the cause of Texas tick fever, Paul de Kruif says: "He was first, and remains the captain of American microbe hunters. * * * He showed men an entirely new and fantastic way a disease may be carried—by an insect. Wipe out that insect, dip all of your cattle in fields where there are no ticks, and Texas fever will disappear from the earth. Today whole states are dipping their cattle and today Texas fever which once threatened the great myriads of American cattle is no longer a matter of concern."

Dr. Smith has likewise to his credit the discovery of the cause of bovine tuberculosis, and was the first to distinguish the bacillus from that causing the disease in human beings.

Born in Albany, N. Y., in 1859, he received his bachelor's degree at Cornell University and did his medical work at Albany Medical College. In 1884 he came to the U. S. Bureau of Animal Industry, then in a stage of its development that can best be described as embryonic. In spite of meager facilities it was during this period that he cleared up the mystery of tick fever. In 1895 he became director of the pathological laboratory of the Massachusetts State Board of Health and served at the same time as professor of comparative pathology on the faculty of Harvard University. Since 1915 he has been head of the department of animal pathology at the Rockefeller Institute for Medical Research at Princeton, N. J.

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ZOOLOGY

Mouse Plague Abating

Half a million dollars will probably be the loss to farmers from the severe plague of mice in Kern County, California, which now shows signs of abating. The U. S. Department of Agriculture joined farmers and state workers in conducting a poison campaign. Strychnin poison, laid about the edges of the great alfalfa-planted area where the mice are feasting, is killing them off by millions. At the end of a month the plague should be over, according to Vernon Bailey of the U. S. Biological Survey, and the farmers of Kern county will be able to start their spring planting with a clean slate—after paying the big board bill that the mice ran up during the plague.

Field mice present a real agricultural problem. Their appetite is for things important to man such as grass, grain, bark of trees, and even root crops and vegetables. They are almost incessant feeders and, moreover, are prolific and rapid breeders. The total increase from a pair of field mice, if all lived and bred, would be over 1,000,000 individuals at the end of a year. Thirty-eight states in this country are "mouse states" in which precautions should be taken to prevent such plagues as the one now raging in California. The only states in which mouse plagues may not arise are the states bordering on the Gulf of Mexico, and Tennessee, Kentucky, Arkansas and Oklahoma. As few as ten field mice to the acre on the 65,000,000 acres of hay raised in mouse states would cause a yearly money loss of some \$30,000,000 in hay alone. During a mouse plague when the mice are present in much larger numbers the loss is immense.

To minimize the chances of such plagues, Mr. Bailey recommends that the farmers clean up the fields, meadows, borders, roadsides and ditch banks to give the herons, hawks, owls, gulls and other birds of prey a chance to see and catch the mice and thus preserve the necessary degree of control.

The situation in parts of France is so serious that the Pasteur Institute has been experimenting with a disease which kills off the mice in three days. Grain is soaked in a solution containing the bacilli which cause the disease. The mice eat the grain and develop a mortal distemper which they rapidly transfer to each other.

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The Aztecs took steam baths.