

MEDICINE

# Typhus Fever in Man Proved To be Transmitted by Fleas

Latest Martyr of Science, Accidentally Bitten While Working with Insects, Now in Hospital Fighting Disease

**B**ECAUSE he found that a bit of chiffon laid over the end of a glass tube made it possible for experimental fleas to bite guinea pigs infected with typhus fever. Dr. Elmer T. Ceder, 26-year-old research assistant at the U. S. National Institute of Health, is now lying on a hospital bed fighting the disease in his own body.

Fortunately this latest martyr to science is not critically ill and is expected to recover. The American typhus fever, from which he suffers, is not so fatal as the European form of the disease, public health officials pointed out.

Most of the fatal cases of supposed typhus fever in this part of the world have turned out to be Rocky Mountain spotted fever, investigations by Drs. R. E. Dyer, L. F. Badger and A. S. Rumreich of the National Institute of Health showed. It was in part of this very research that Dr. Ceder was assisting when he fell a victim to typhus fever.

Dr. Dyer, investigating the two diseases as they occurred in Washington and nearby states, found among other things that fleas apparently transmitted one of the diseases, which was presumably typhus fever. To prove this, it was necessary that he have uncontaminated fleas feed on animals infected with typhus fever and then have the same fleas feed on uninfected animals. If the animals caught the disease, he could prove that the fleas had transmitted it. However, he struck a snag in his investigation when he tried to get the fleas in their sterile glass tube to bite the guinea pigs.

When young Dr. Ceder joined the staff of the National Institute of Health he was set at this task. He discovered that the fleas in the glass tube could not bite because the slippery sides of the tube gave them no foothold for their legs. So he ingeniously covered the ends of the tube with a piece of chiffon which gave the fleas a good surface to anchor themselves to while they bit and sucked the pigs' blood.

In the course of his work, one of the infected fleas bit Dr. Ceder instead of

the pigs, it is thought, thus giving him the disease. This young research worker has thus contributed in two ways to science's knowledge of typhus fever. First, he advanced the laboratory research on the transmission of typhus fever in animals and second, he has given conclusive, if unintentional, proof that it is also transmitted to man by fleas.

Dr. Ceder was born in Minneapolis in 1905 and received his medical degree from the University of Minnesota in 1929. He served his internship in one of the U. S. Public Health Service hospitals and was assigned to duty in Pittsburgh as an officer of the Service. He was transferred to the National Institute of Health early in 1931.

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PLANT PHYSIOLOGY

## Cold Storage Does Not Harm Vitamin C of Apples

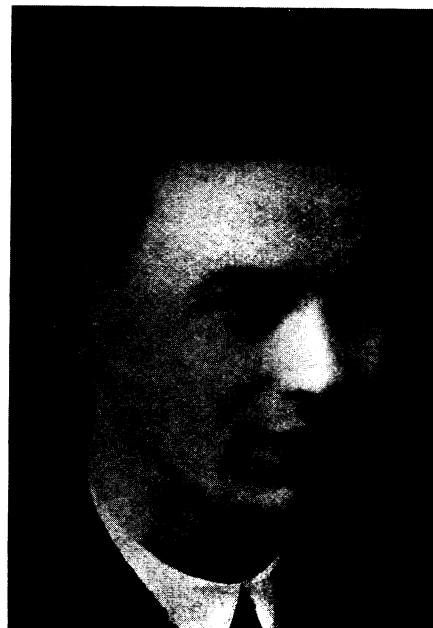
**A**PPLES come through cold storage safely without harm to their precious vitamin C, scientific studies have just shown. Frozen apples have been kept for four months without losing an

ARCHAEOLOGY-GEOLOGY

## Tree Ring Studies Steadily Decrease Undated History

**D**ATED HISTORY on the American continent will soon be pushed back to the dawn of the Christian era, if present studies of tree-ring material develop successfully. This news of his researches was revealed by Dr. A. E. Douglass of the University of Arizona, in his address before scientists gathered to honor himself and a fellow scientist, Dr. Ernst Antevs of Sweden.

Dr. Douglass and Dr. Antevs received Research Corporation Awards of \$2,500 each for their successful re-



**DR. ELMER T. CEDER**

—the 26-year-old research worker who was infected while experimenting with the transmission of typhus fever.

appreciable amount of this vitamin.

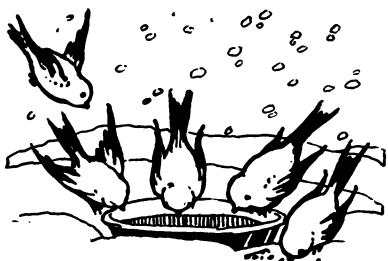
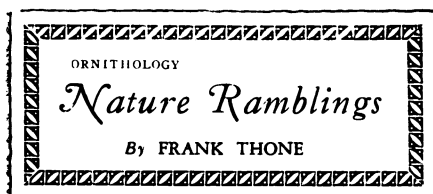
This important fact has been ascertained by Dr. S. S. Zilva and Miss M. F. Bracewell at the Lister Institute, and Dr. Franklin Kidd and Dr. Cyril West at the Low Temperature Station, Cambridge, England.

The apples used were Bramley's Seedlings. It was found that they could be stored in air at 3 degrees Centigrade or 35.6 degrees Fahrenheit for five months and yet contain as much vitamin C as they did originally.

*Science News Letter, December 26, 1931*

searches in measuring the years in undated centuries of the world's past. The awards were presented by Chief Justice Charles Evans Hughes, chancellor of the Smithsonian Institution.

Dr. Douglass told how, using tree rings as his yardsticks of time, he constructed an unbroken chronology of annual tree rings in the Southwest from the present back to 700 A. D. Tree-ring specimens for the earlier centuries of the series were gathered, with the cooperation of (Please turn to page 415)



The Cup of Warm Water

**H**E WHOSE BIRTH we celebrate on Christmas Day once assured us that he would remember even a cup of cold water given to the least of his creatures. That he loved birds is evidenced by his frequent references to them during the recorded years of his life. Charity to the birds would seem, therefore, a most fitting Christmas benevolence.

We often think to give birds food in winter. It involves no more than scattering table crumbs on the snow; though if our benevolent instincts be more fully developed we may build feeding trays more or less elaborate. But water is no less necessary to birds than food, and they are often harder pressed for something to slake their thirst than they are for something to eat. This is especially so in severe weather, when the chance pools that usually afford them a supply are frozen solid. It is then that a pan of water set out in a sheltered spot (but one clear of cat-danger!) will be most welcome to the birds.

And do not set out merely a pan of cold water, if the weather be freezing. It will immediately seal itself with the ice, perhaps before all the bird clients that visit your yard shall have had a chance to drink. Let it be warmed up—make it as warm as you like your own tea or coffee. Then it will be a long time freezing, for water has an astonishing capacity for heat and loses it more slowly than any other common substance. Birds do not have the same prejudice American humans have in favor of ice water, especially in winter. They are glad to get something warm to drink. There is no charity bought so cheap that can make so many living creatures happy as a cup of warm water.

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## Tree Rings Extending American Dated History

archaeologists, in Indian pueblo ruins. When dates were established for the tree-ring specimens, the age of the pueblos was also known. Seventy-five pueblos have been dated.

Now Dr. Douglass is working with tree-ring specimens gathered by Earl H. Morris, archaeologist, in ruins and caves of early pueblos and late Basket Makers. The tree rings cover six hundred years of time, and do not appear to fit into the tree-ring calendar of any centuries since 700 A. D. When a piece of wood is found containing rings that overlap the eighth century and the earlier undated material the age of the six hundred rings can be told.

Dr. Antevs' researches into the passage of time go back to the ages when the great ice sheets advanced from the north and covered large portions of the earth. For measuring time in this distant era, Dr. Antevs uses the layers of clay deposited in ancient lake beds. These thin twin layers, alternating dark and light, were deposited annually in the wake of retreating glaciers.

Dr. Antevs reported that he has obtained records of the clay layers or varves, for considerable parts of the age

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when the North American ice sheet was dwindling from its farthest south point of advance.

The ice sheet began to withdraw almost immediately after reaching its southernmost line, he stated. From Long Island, it retreated to Hartford, then into Vermont and New Hampshire. Tracing this retreat by examining the annual layers of clay, Dr. Antevs found that it took the ice 4,100 years to melt back 185 miles between Hartford and St. Johnsbury, Vt. Around Amherst, Mass., the ice border halted and re-advanced.

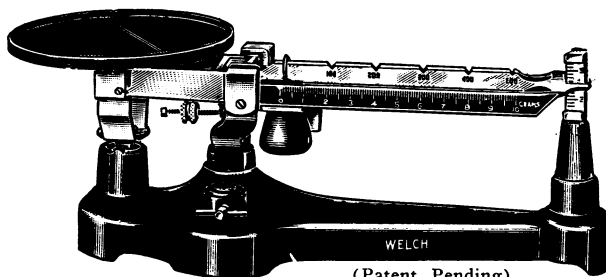
The tree rings and the clay varves not only measure time but offer science excellent material for the study of long, and short, temperature cycles. In clay deposits and tree-ring growth, the earth recorded both rainy years and droughts.

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The Babylonian king Hammurabi has been called the "father of canals" because he built so many in his kingdom.

The Chinese have been eating soybeans for at least 5,000 years.

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