

BIOLOGY

Microscopic Animals Survive Sub-freezing Temperatures

ONE-CELLED animals of microscopic size remain alive and active at temperatures below the freezing-point of water, if the water in which they swim can be prevented from turning into ice. Experiments looking into their behavior under these circumstances have been carried out by Charles Wolfson, of Lawrence, Kansas, and reported before the American Association for the Advancement of Science. Mr. Wolfson published some of his results. (*Ecology*, October.)

Water can be chilled to temperatures well below ordinary freezing point (32 degrees Fahrenheit) by first drawing it into hair-fine tubes, and then cooling it. This is a trick long known to physicists.

Mr. Wolfson made up a number of such capillary tubes, and into them introduced the one-celled swimming animals known to zoologists as Paramecium, or slipper-animalcules, because of their curious slipper-like shape as seen under the microscope.

In their normal condition, these tiny creatures dart about incessantly, lashing themselves along by means of a fringe of minute fingerlike processes called cilia. As Mr. Wolfson lowered the temperature in his specially constructed apparatus, he could observe

the point at which the animals first stopped swimming, then ceased even a feeble beat of their cilia. Then he warmed them up again and noted the temperatures at which they again went into action.

Temperature points for both stopping and resuming action differed with different specimens. In some, it was as low as 6 degrees Fahrenheit; in others, as high as 27 degrees. Most of the specimens stopped movement at about 21 degrees. In general, movement was not resumed on re-warming until the temperature was a little higher than it had been on stopping.

Some of the specimens "curled up and died" even after being warmed up again, but others recovered completely and seemed none the worse for their sub-icy experience.

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ENTOMOLOGY

Grasshopper is Chivalrous And Protects the Female

GRASSHOPPERS are gentlemen, even if they are a bit flighty. Evidence that should convince any reasonable inquirer was offered to the American Association for the Advancement of Science, by Dr. E. D. Ball, of the University of Arizona.

Many of the short-winged grasshoppers of the west, Dr. Ball stated, have a peculiar method of protecting the females. The females are large, and cannot move with the quickness and agility of their smaller, more brightly colored mates.

"As one approaches," Dr. Ball continued, "the males leap up into the air, make a flip or two, alight and spring up again, thus distracting the eye from the obscure female hiding in the grass. Even if the female is forced to jump she alights and immediately hides, while a dozen males spring up and again distract attention."

Grasshoppers are not by any means all marauders and destroyers, any more than germs are universally disease-causers, Dr. Ball also pointed out. In a wide range of southwestern country which he has investigated, there are

about 130 species of grasshoppers. Of these "only five or six would be classed as injurious to crops and scarcely a dozen more would be listed as of serious injury to the grasses of the range, leaving well over a hundred that are either beneficial or of little importance one way or the other."

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PLANT PATHOLOGY

Even Dead Trees Present Dutch Elm Disease Menace

EVEN dead elm trees are dangerous, where Dutch elm disease is about. At the meeting of the American Association for the Advancement of Science, Drs. R. P. True and E. T. Miller of the U. S. Department of Agriculture told of a cooperative survey on 750 dead and dying elms, within and outside the known elm disease area in the region around New York City.

Of all dead trees in sample plots in the known disease area, nearly ten per cent. were found to harbor the fungus of Dutch Elm disease, while no sign of the infection was found in dead trees in plots outside the elm disease area.

"The positive findings indicate the necessity of sanitation work in connection with the Dutch Elm disease eradication program," the scientists commented.

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MARINE ZOOLOGY

Oysters Filter Barrel Of Water Every Day

OYSTERS filter a barrel of water through their bodies every day, sifting out the minute plants which are their food, and obtaining the oxygen to keep their very modest vital fires alight. At the meeting of the Zoological Society of America, Dr. T. C. Nelson of Rutgers University told of his measurements of the efficiency of the oyster as a living pump.

The oyster's rate of handling water varies with the temperature. At about 50 degrees Fahrenheit very little water-filtering is done. Above this temperature the flow increases rapidly, to a maximum at about 85 degrees. During one seven-hour period, a single average-sized oyster, in water ranging between 75 and 80 degrees, filtered 111 liters of water—just about an even barrel.

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