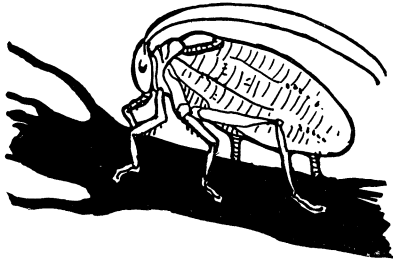




BIOLOGY



Breathing Without Lungs

MAN AND ALL his vertebrate kin above the level of fishes are lung-breathers. They take air into those elaborate sacs in their chest cavities, where the oxygen is transferred to the red blood corpuscles which in turn carry it to the points where it is needed by the laboring muscles, secreting glands, and feeling brain and nerve cells.

Nothing at all like this goes on inside the bodies of insects. They have no oxygen-carrying corpuscles in their blood. Insect blood is simply a medium of food transfer, like the plasma or fluid portion of human blood; the second function of oxygen carriage is entirely lacking.

Insects get the necessary supplies of air to all parts of their body simply by extending their breathing apparatus throughout their bodies. It is as though our lungs had branches that ran out into our fingers and toes, and all points in between.

This highly branched condition of the insects' breathing apparatus is materially helped by having many entrances and exits, instead of only one as in the air-breathing vertebrates. If you will look at the side of a large insect, such as a katydid or grasshopper, you will see a row of dots along it, one to each segment of the abdomen. These are the breathing pores, or spiracles. From each of them a thin-walled set of branching tubes runs to all neighboring parts of the body, carrying the needed air.

This curious system of piping air directly throughout the body has two notable effects on insect physiology. First, it makes the insect body exceedingly light for its bulk, which is a real advantage to an animal group which is primarily a flying and leaping order. The second effect is to limit quite sharply the practicable size of the organism. The biggest insects that have ever lived were the foot-long dragonflies of the Coal Age, the mouse-sized cockroaches that were their contemporaries, and the huge Goliath beetles of the modern tropics. Probably bigger insects cannot exist, because the penetration of air into the body through their peculiar direct-ventilation system would become physiologically ineffective after the first half-inch or so.

Science News Letter, July 1, 1933

Mystery Island in Quebec, the national domain camping site of Canadian Boy Scouts, has been made a bird sanctuary by the Canadian Government.

Plans are under way for building the longest bridge in Europe—a two-mile span to connect the Danish island Zealand with the islands of Lolland and Falster.

BACTERIOLOGY

Fermentation Frees Seed From Bacterial Disease

FERMENTING tomato pulp until the seeds drop out has been found to be an excellent method of freeing the seeds from the destructive disease, bacterial canker, which has presented a problem to growers of tomatoes for canneries.

The value of fermentation in this connection was discovered by accident, though scientific insight played a part in taking advantage of the chance discovery. H. L. Blood, of the U. S. Department of Agriculture, had some canker-infested tomatoes, from which he wanted to extract the seeds, so that he might try on them the effects of various disinfectants.

Lacking a modern power seed extractor, he fell back on the old discarded method of fermenting the seeds out in a vat.

When he planted the seeds from the diseased fruits he nevertheless got healthy plants. The results from untreated seeds were as good or better than those from disinfected seeds.

He repeated the experiment in Utah, where the disease has been destructive. Again the fermented seed from infected fruit proved free from the disease, while mechanically extracted seeds still carried the infection.

A more exact investigation is now under way, to determine if possible the factors in the fermenting vat that kill off the infection, and to determine also the conditions under which fermentation-treated seeds can be produced best.

Science News Letter, July 1, 1933

MEDICINE

Hope For New Treatment Of Addison's Disease

HOPE that Addison's disease may be attacked by a new form of treatment, as a result of recent research on the hormones of the pituitary gland, was expressed by Dr. Herbert M. Evans of the Rockefeller Institute at the recent Congress of American Physicians and Surgeons.

This new treatment would not be mere replacement of the adrenal cortex hormone, lack of which results in Addison's disease. Replacement treatment, like giving insulin for diabetes, is already being used by doctors who give a very powerful extract of adrenal cortex to patients suffering from Addison's

CONVENIENCE COUPON

for New or Renewal Subscription to Science News Letter

Send this coupon to Washington while you are thinking of it.

Science News Letter,
21st and Constitution Avenue,
Washington, D. C.

Please start renew my subscription to SCIENCE NEWS LETTER. I am enclosing remittance as checked: 2 years, \$7 1 year, \$5

Name
Street
Address
City and
State

If this subscription is a renewal, check here