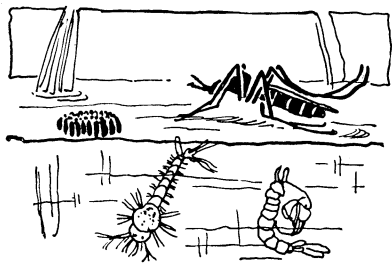


## NATURE RAMBLINGS

by Frank Thone

PARASITOLOGY



### Trouble by Threes

WHILE it proverbially takes but two to make a quarrel, to make certain sicknesses it takes three.

Many ordinary diseases, like typhoid fever, diphtheria and boils, are affairs of two parties only, like ordinary quarrels. They concern only the germ that makes the trouble and the person in whom the trouble is made—technically (and somewhat ironically) called the "host." The germs of such diseases can go directly from one such afflicted host to another person and set up housekeeping in his tissues without further ado.

But there is a whole series of disease-causing organisms that prey upon lower animals and plants as well as man, that cannot go from one host directly to another individual of the same species. They are always parasites that have a rather complicated life cycle, sometimes appearing in such varied forms at different periods of their existence that at first they are mistaken for entirely separate species until the whole evil career has been traced in detail, and all its stages known. As a rule, one of these complex-lived troublemakers will pass through one or more of its phases in the body of one animal, and then have to complete its life cycle in the body of another. Such a proceeding is known to medical scientists as an "alternation of hosts."

Perhaps the most familiar example of such a host-alternating disease is malaria. The one-celled animal parasite that causes "chills 'n' fever" goes through part of its development in the human body, but before it can receive the power to infect another human being it must spend a time in the body of its alternate host, the *Anopheles* mosquito. Malaria of birds, a disease

similar to but not identical with that of man, has a similar alternation of hosts.

Animals also have diseases, that require an alternation of hosts. Tapeworm of cats must spend part of its life in mice. The route of transmission is simple and easy to follow here; but not so easy in the case of a liver disease of sheep, the causal organism of which uses a snail as its alternate host. But it is a water snail, and sheep drink water—so the evil circle can close itself very readily after all.

Plants also suffer from diseases with alternate hosts, most of them caused by various forms of parasitic fungi. Thus, the black stem rust of grains has the common barberry as its alternate host, while the crown rust of oats shifts to buckthorn, another ornamental shrub, for part of its life cycle. In fact, all the rust diseases of plants—and their name is legion—are preyers upon alternate hosts, which are usually quite unrelated to each other botanically.

*Science News Letter, January 27, 1934*

NUTRITION

## Prizes For Discovery Of Vitamin Requirements

FOR determining how much vitamin A is needed by human beings, a pharmaceutical firm, Mead, Johnson and Co., is offering \$20,000 in two awards. The first award of \$15,000 is for clinical research and the second of \$5,000 is for laboratory research.

Present knowledge of this vitamin is largely based on investigations with rats, which become blind and die when completely deprived of vitamin A. The award is offered in the hope of stimulating research that will yield exact knowledge as to why or whether human beings need vitamin A and just how much of it is needed. Ten physicians and biochemists of high standing have consented to act as judges. The time limit has been set as Dec. 31, 1934, but this may, at the discretion of the judges, be extended to Dec. 31, 1936.

*Science News Letter, January 27, 1934*

## First Glances at New Books

Additional Reviews  
On Page 64

### Physics

THE PHYSICS OF ELECTRON TUBES—L. R. Koller—*McGraw-Hill*, 205 p., \$3. Fundamental physical phenomena involved in the operation of electron tubes are treated from a point of view which will be helpful to engineers and students of physics who have had no special training in electronics. The author is a physicist in the General Electric Research Laboratory and the volume is one of the International Series in Physics edited by Dr. F. K. Richtmyer.

*Science News Letter, January 27, 1934*

### Radio

RADIO AND EDUCATION—Edited by Levering Tyson—*Univ. of Chicago Press*, 197 p., \$2.50. These proceedings of the third annual assembly of the National Advisory Council on Radio in Education contain valuable information upon the intellectual uses of radio broadcasting.

*Science News Letter, January 27, 1934*

### Electricity

ELECTRIC METERS—Richard R. Ranson—*American Technical Society*, 232 p., \$2. A practical treatise on direct-current and alternating-current meters, measurements of power and resistance, reading and testing of watt-hour and graphic meters.

*Science News Letter, January 27, 1934*

### Forestry

THE PEOPLE'S FORESTS—Robert Marshall—*Smith and Haas*, 233 p., \$2. The scientist, who after a year's study in Alaska wrote Arctic Village, a Literary Guild selection, turns his talents to the preparation of a well-written, interesting and informative presentation of our forest problem. He advocates government ownership of forests.

*Science News Letter, January 27, 1934*

### Paleontology

AN OLIGOCENE EAGLE FROM WYOMING—Alexander Wetmore—*Smithsonian Inst.*, 9 p., 10c.

*Science News Letter, January 27, 1934*

### Vocational Guidance

VOCATIONS—William Martin Proctor—*Houghton Mifflin*, 390 p., \$1.48. A revised and enlarged edition of a textbook for use in high schools.

*Science News Letter, January 27, 1934*

### Paleontology

PLIOCENE BIRD REMAINS FROM IDAHO—Alexander Wetmore—*Smithsonian Inst.*, 12 p., 10c.

*Science News Letter, January 27, 1934*

### Paleontology

THE BRYOZOAN FAUNA OF THE VINCENTOWN LIMESAND—Ferdinand Canu and Ray S. Bassler—*Govt. Print. Off.*, v+108 p., 21 pl., 20c.

*Science News Letter, January 27, 1934*