

## ENTOMOLOGY

**Riddle of Hoppers' Parasites**

A new angle in the already complicated puzzle of the cause of sex in animals has been uncovered by the researches of three workers in the U. S. Department of Agriculture, Dr. N. A. Cobb, Dr. G. Steiner and Dr. J. R. Christie. Stated roughly, they have found that crowded quarters, possibly complicated by short rations, tend to produce males, while more room and better living conditions generally tend to produce females, in certain parasitic hairworms that infest the bodies of insects.

Their discovery was the result of an effort to play the old game of the fighting entomologist, turning one small creature against another in man's unending warfare on the devouring hosts that threaten his crops. In the present instance they were trying to find how many eggs of the hairworms a grasshopper would have to eat on his natural diet of leaves, to become so heavily infested that he would die without descendants. An average of less than fifty, they learned, would produce a fatal family of hairworms in the poor hopper's insides. A few less, and the hopper lived, but could produce no offspring.

It was also found that unmated female hairworms laid eggs which hatched in perfectly normal fashion, but that all of the young from these fatherless eggs were females. This was not surprising in itself, for unfathered offspring are common in the lower branches of the animal kingdom.

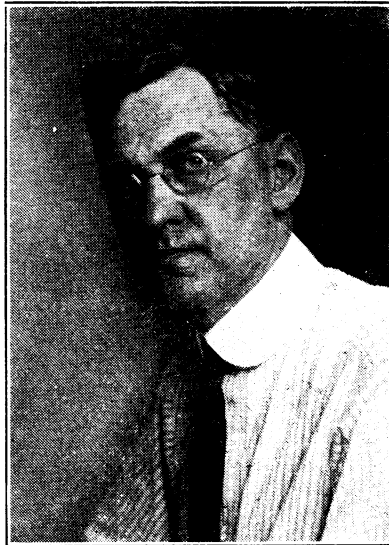
But when these unfertilized eggs were fed to grasshoppers in excessive numbers the worms that hatched from them were all males. When only a few eggs were administered to the victim hoppers, they hatched out females. Intermediate numbers turned out mixed batches of males and females, the proportion of males bearing a fairly constant relation to the number of eggs swallowed by the luckless grasshoppers.

Results similar to those observed on grasshoppers were obtained both in the laboratory and in the field with ants, midges, tea-bugs and other insects and their special genera of hairworms.

Dr. Cobb and his associates suggest that inasmuch as grasshoppers are very abundant and their hairworm parasites even more so, good opportunities for further research into the cause and possible control of sex are offered by this material.

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## ASTRONOMY



WILLIAM SNYDER EICHELBERGER

**Star Tabulator**

The layman is sometimes surprised to find that the chief astronomical work of the United States government is under the Navy Department, in the Naval Observatory. But this can be understood when it is recalled that the whole problem of navigating a ship, away from landmarks, is essentially an astronomical one, depending on the position of heavenly bodies. And in order that navigation may be done most accurately, the motions and positions of these bodies must be precisely known.

The "American Ephemeris and Nautical Almanac" provides this information, and so it, and its little brother, "The Nautical Almanac" are the vade mecums of astronomer and navigator alike. As a consequence, the Director of the Nautical Almanac occupies one of the most responsible of all astronomical positions. This is the post that Dr. Eichelberger has held with distinction since 1910. In addition to his scientific duties, he has to be something of a diplomat as well, for the corresponding offices of the different leading countries cooperate, each producing part of the material that all the almanacs contain.

Dr. Eichelberger was born in Baltimore in 1865. In 1891 he received his Ph.D. from Johns Hopkins, and in 1898 he joined the forces of the Naval Observatory, where he has remained since. A few years ago the Royal Astronomical Society of Great Britain gave him the coveted honor of their associateship.

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The western horned owl has one mate for life.

## MEDICINE

**Neutralizes Cancer Virus**

Another advance has been made toward the solution of the cancer problem.

Dr. Margaret R. Lewis of the Department of Embryology of the Carnegie Institution of Washington and Dr. Howard B. Andervont of the Johns Hopkins University have just succeeded in establishing that the unidentified organism that causes the Rous chicken sarcoma, can be rendered inactive by means of small quantities of aluminium and calcium salts. The significance of this work lies in its possible application in the treatment of human cancer. An immense amount of research will have to be done before any such result is likely to ensue but these recently learned facts point the way to a new direction for cancer research. If it is found that calcium and aluminium compounds, either given by mouth or injected into the blood stream, will have an adverse effect on cancer in chickens, it may lead to results of great benefit in treating human cancer because these compounds are more or less inert with little capacity to harm body tissues.

"While the primary tumor of this particular type of malignant chicken cancer," explained Mrs. Lewis, "differs in some respects from those found in human beings and higher animals, the secondary tumors or metastases, as they are called, are similar to the malignant sarcoma of man. The chicken tumor behaves quite as those of other kinds of animals in that it invades the tissue, develops metastases, leads to the death of the animal and can be transferred by means of transplantation from one animal to another of the same species, though not, of course to an animal of a different species.

"The chicken tumor also resembles certain other diseases in that it is caused by a still unidentified agent that behaves like the so-called filterable viruses responsible for small pox, rabies and encephalitis in rabbits. Many years ago Dr. Peyton Rous and Dr. J. B. Murphy of the Rockefeller Institute for Medical Research found that the causative agent for chicken tumor remained active in a filtrate, a glycerine extract or in the dried material of the tumor itself. It was also established by these workers that inoculation of these agents not only produced the disease but if the animal recovered from the tumor it was more or less immune to further inoculation of the tumor virus."

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