

Age of Man Has Not Yet Arrived

Entomology

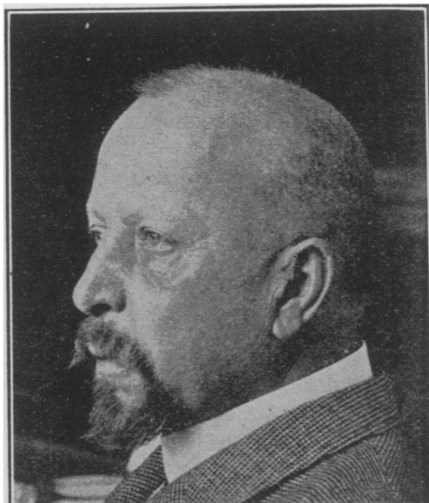
Following are the first reports of the Fourth International Congress of Entomology, held at Ithaca, N. Y., August 12-18. Further material will be contained in next week's issue of the SCIENCE NEWS-LETTER.

War between Humanity and the Hexapods was pictured in unfamiliar colors before the opening session of the Fourth International Congress of Entomology. The president of the Congress, Dr. L. O. Howard of the U. S. Bureau of Entomology, pointed out that the prevalent conception of an Age of Man finding its supremacy threatened by a looming Age of Insects is not accurate. The world is still in the Age of Insects, he said, and the Age of Man is not yet established. Taking into account the facts now known about evolutionary history, we must look upon the insect world as the old established order, an animal hierarchy of such excellently ancient lineage that it can count even the dinosaurs as a race of upstarts that had their day and ceased to be. It is the race of men, and not only they but all of their warm-blooded relatives, who must be looked upon as the invaders, as the attackers, as those who seek a place in the sun at the expense of the present landlords.

Since man is the aggressor in this campaign, Dr. Howard argued, it is up to him to justify his claim to existence and to possible final dominance. To this end he must use his unique gift of intelligence and make his knowledge of the ways of his six-legged enemies outweigh the numerical odds arrayed against him.

A paradox of pesticulture, wherein man encourages insects to prey on plants, prevails in the Antipodes. The secret of it is, that the plants are weeds, and in devouring them the ertswile pests are unwittingly serving their cleverer opponent. This biological control of troublesome weeds is developing into a distinct branch of entomological science, which was discussed at the Congress.

The discussion also served to illustrate the fact that Britain's far-flung battle line exists in other fields than the military. The three men who with their assistants are cooperating to fight the weeds of Australia and New Zealand are Dr. R. J. Tillyard of Australia, Dr. Ernest Marsden of New Zealand and Dr. A. D. Imms of England. Australia's most terrible weed is the common prickly pear cactus, introduced from America. To prevent it from completely overrunning warmer parts of the island, the



DR. L. O. HOWARD, President of the Fourth International Congress of Entomology

cactus regions of the United States were combed for insects that would eat cactus and nothing else. The search has been very successful, and the Australian cactus pest is now well under control. The many-legged allies of man in this fight against a vegetable include the cochineal bug, cultivated in Mexico for a red dye, several other true bugs, the caterpillars of three moth species, and a variety of the almost microscopic red spider.

In New Zealand there are three introduced weeds that are very troublesome, the common blackberry, the European gorse, and the ragwort, a plant allied to the dandelion and quite poisonous to live stock. A moth species has been found whose caterpillars will take care of the ragwort situation, and a weevil on the gorse gives promise. A caterpillar has been tried out for the blackberry pest, and a beetle whose grubs bore into the stems may also be useful.

This introduction of destructive insects to prey on weeds is admittedly a ticklish job, for if one of them should turn on an economic plant instead of the weed for which it is intended, the remedy might itself become a scourge. However, the insects are all kept most carefully caged until they are tried out on all possible diets in addition to the one for which they are imported, and if they show a taste for a valuable plant they are at once destroyed. This period of quarantine also serves to clear the insects of their natural parasitic enemies before they are released. As an

insurance measure, however, a stock of parasites of each species is kept available, so that if one of the devourers should go wrong it could have a counter-attack launched against it.

For the warfare on the home front, here in the United States, chemists are seeking new weapons. The arsenates of lead and of copper, or Paris green, which are the staples of present-day Borgian banquets for bugs, may soon be varied with arsenates of other metals, such as aluminum, iron, magnesium, barium, and zinc, with additions of such things as thallium sulphate, copper cyanide and various fluorides and fluosilicates. In addition, stated Dr. R. C. Roark, of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture, some 400 patented moth-proofing compounds are being investigated for their possible usefulness in man's chemical warfare against the insects.

Warfare against insects whose bites or stings plant deadly germs in the human system, occupied much of the attention of the members of the Congress. Dr. R. R. Parker of the U. S. Public Health Service outlined the results of researches on Rocky Mountain spotted fever which he and his colleague, Dr. R. R. Spencer, have been carrying on in Montana.

This dangerous disease is curiously uneven in its behavior, Dr. Parker said. In parts of Montana 90 per cent. of all persons who take it die, while in another region, in the neighboring state of Idaho, only 5 per cent. of the cases terminate fatally. There is no effective treatment once the disease has been contracted, and no control measures have been devised against the ticks whose bites initiate the attack. During the past few months, however, the effectiveness of a preventive serum has been conclusively demonstrated. It prevents mild forms of the disease altogether, and usually checks the course of the severer attacks. It also cuts the death rate very materially. Among the twelve cases contracted in a group of 5000 serum-treated persons only one death occurred, while among eighteen cases contracted by non-treated persons during the same time fifteen deaths occurred.

The ill account of the tick that carries spotted fever germs is not closed with this indictment. The same crawling menace also harbors tularemia, "tick paralysis", (*Turn to next page*)

Age of Man Not Yet Arrived—*Continued*

and possibly one other disease of man, as well as sheep tularemia, and the "tick paralysis" of sheep and cattle. A parasitic wasp, which destroys the young of ticks, has been brought from France to combat this pest, but experiments with this helpful insect are as yet only in the beginning stages.

The weather man should be called into the alliance now existing between the entomologist and the medical scientist, according to Dr. Erich Martini of Hamburg, Germany. He called attention to the need for a better understanding of climatic factors as they affect insect-borne diseases. Sometimes the problem is relatively simple: frosty weather kills flies, and so abates fly-borne plagues, such as some types of dysentery and some epidemics of typhoid fever. But sometimes the operation of climatic factors is not so easily understood. The peak of the annual spread of tertian malaria, for example, comes before the warm weather that is most favorable for mosquitoes. This, upon investigation, seems to be because the malaria germ itself is better able to carry on its mischief-making in moderately warm than in very warm weather. For this reason Dr. Martini urged more exact study of climatic factor complexes in laying out anti-insect campaigns.

Prof. W. J. Baerg of the University of Arkansas, noted among entomologists as the man who has the nerve to let tarantulas, scorpions and centipedes bite and sting him, detailed the results of his first-hand experiences with arthropod poisons. Most of the poisons of spiders and their ugly-looking relatives, he said, are greatly overrated. A centipede bite, even from a big specimen, is about as painful as a bee sting, but no more harmful. The same is true of most tarantulas—and it is usually hard to get a tarantula to bite at all. The much smaller Black Widow spider of the South is equally reluctant to bite, but its venom is much more wicked in its effects. A Black Widow bite once put Prof. Baerg to bed for three days of rather pronounced illness. But, he added philosophically, it gave him and his attendant physicians a good chance to get an authentic record of the symptoms.

Prof. Baerg has just returned from Durango, Mexico, where he has been investigating the notorious Durango scorpion, which has the reputation of a killer. There is no doubt, he said,

that this creature is very poisonous, and that it has claimed the lives of a good many human victims, especially among children. Adults it makes sick, but seldom kills. The poison causes a paralysis of the respiratory system. Mexican medical men have recently developed a curative serum which promises to rob the sting of this scorpion of most of its terror.

Meet *Trichogramma minutum*. This little insect is a great friend of the human family. Most of us do not know her, because she is too small to be seen, as she goes about the world, doing good to us and ill to our enemies.

Trichogramma is one of those interesting though tiny insects that lays her eggs in the eggs of other and larger insects that eat man's crops and orchards. The grubs that hatch out of such parasitic eggs prey upon the larger eggs in which they are laid, and so destroy them. Some of these egg parasites are quite particular, patronizing the eggs of only one group of victim-insects; but *Trichogramma* is not at all fussy. That is what makes her so useful. She will lay her egg within the egg of any other insect she can get at that is large enough and not too hard-shelled.

To date she has had to take her own chance in the wild state, so that in an unfavorable season there were not enough of her sisterhood to take care of the eggs of the teeming pests. Now, however, she has been taken in hand and brought up in huge numbers in captivity. The method followed by Stanley E. Flanders, of Saticoy, Calif., is simple. He first breeds a lot of pests—grain moths—in 40 to 50 bushels of wheat. Then he lets the *Trichogramma* mothers loose at their masses of eggs. Presently he has perfect clouds of *Trichogramma* insects, which he then carries out into the California walnut orchards, to mop up the codling moths.

A new technique in the handling of another insect friend of man, which has been reared much longer in captivity, was demonstrated by Dr. Lloyd R. Watson, of Alfred, N. Y. He has worked out a way of artificially fertilizing queen bees, which will make it possible to breed bees as accurately and scientifically as we now breed cattle. Hitherto the fertilization of the queen has been a matter of chance. The young queen flies out of the hive, mates with any drone she may meet in the

air, and returns to take up her duty of laying thousands of eggs. But beekeepers have never known what the father of the new brood was like. By Dr. Watson's method, which involves the use of microscopic glass tubes of unimaginable fineness, the process is made largely mechanical, and the drone that is to be the father of the bee colony can be selected just as accurately as can the queen that is to be the mother.

A poultry raiser is glad enough to see one chick or duckling hatch out of one egg. He would become somewhat pop-eyed if one egg should suddenly provide him with a whole yardful of fowls. But that, in effect, happens in the insect world, according to Dr. R. W. Leiby of the North Carolina Department of Agriculture.

The insect group in which this strange phenomenon occurs, Dr. Leiby explained, constitutes a winged clan friendly to man in his warfare with the creeping things that take toll of his crops and orchards. They are tiny wasp-like insects, that lay their eggs in the bodies of caterpillars and other insect larvae, so that their young, when they hatch out, feed on the tissues of this unwilling host until it dies. Obviously, it is often a bit difficult to deposit an egg in a writhing and terrified caterpillar, so that if one egg can be called upon to do the work of many it will be a great advantage to the species.

And that is what happens. Normally an egg divides into two cells, four cells, eight cells, many cells; and these many organize themselves into a single complete insect larva or grub. The eggs of this group of little wasps, however, do otherwise. In one species the egg divides into two cells, and each of these two then proceeds to subdivide and organize normally, so that twin insects always result. In a cousin species the division goes on until there are 10 or 20 cells before the normal development begins. In a third species one egg develops into 150 individuals, while the egg of the no-race-suicide champion of the whole tribe eventually gives rise to as many as 2,000 young insects.

Science News-Letter, August 25, 1928

Only three states were entirely free from smallpox last year: Connecticut, Vermont, and New Hampshire.