

Plague of Pharaoh Still With Us

Entomology

Conclusion of reports on the Fourth International Congress of Entomology at Ithaca.

Locusts, the most ancient of man's insect enemies and one of the worst, are still being fought as they were in the days of Pharaoh. From Egypt, Russia, Mexico, many other quarters of the world, the officers who direct man's campaign against the locust hordes have brought reports to the Congress.

It is in Russia that the campaign is most highly organized and is being fought along most nearly military lines, including the use of chemical warfare methods and combat planes. In Russia and Siberia there are six principal locust species. They breed in waste places and creep about wingless in great mobs while they are young, and it is then they are attacked; for once allowed to grow wings and get into the air they would be beyond all hope of control.

Anti-locust forces sent out by the central government spot these breeding-places, often using scouting planes for the purpose. Once located, they cover with arsenical poison dust the wild grasses on which the young locusts feed, or set sweetened baits of poisoned bran and sawdust. Part of this work is done by ground machines, which might be considered a tank corps; where the ground is difficult, as in marshes, the dusting is done from airplanes.

At first, wartime gases, especially chlorpicrin, were tried, but these were found ineffectual against the locusts. However, they did wipe out great numbers of ground squirrels, which are as great a pest in parts of Russia as they are in California. The gases flow down the squirrels' dugouts, so that the more they try to escape death the more surely they go to meet it.

Locusts were not the only troubles that Pharaoh's farmers had to contend with. Dr. Hassan C. Efflatoun Bey presented results of his researches into the papyri of his ancient fatherland for entomological references. In a complaining letter from the steward of an estate about 1400 B. C. he found this:

"The worm ate half the crop and the hippopotami ate the other half. The fields were full of rats, a swarm of locusts settled down and fed, the sheep also ate and the birds stole."

Egyptian entomologists, said Dr. Efflatoun, do not now need to go out and catch hippopotami, but they

still have plenty of enemies to fight. The "worm" of which the steward complained is still there; it is the common cutworm. And farmers still have to be exhorted to fight it as the farmers of 3500 years ago were bidden in a royal decree. Modern pests in Egypt include the pink bollworm, fluted scale, mealybugs, Mediterranean fruit fly, and many others. In Egypt as in America, efforts are being made to gain allies from the insect camp, in the form of parasites that lay their eggs in or on the eggs, young or adults of the destroying insects.

An exchange of diplomatic views among allied generals opposing the insect armies was represented by the discussion of Dr. C. L. Marlatt, chief of the bureau of entomology, U. S. Department of Agriculture. Dr. Marlatt spoke on the plant immigration restrictions recently imposed by the United States. These regulations, designed to keep out new insect pests, he said, came very late, long after most other countries had adopted similar measures. Even while they were being debated, between 1909 and 1912, several bad pests and diseases got in, including European corn borer, Japanese beetle, citrus canker and Oriental fruit moth. Since their imposition, however, only two pests have succeeded in breaking through. These were the Mexican fruit fly and the pink bollworm, both of which crossed the southern frontier, admittedly much harder to guard than the seaports.

Even the latter enemies, Dr. Marlatt said, have been held in check. The campaign against the fruit fly especially has been spectacular. It got into the grapefruit growing region around Brownsville, Texas. To get it out, it was necessary to destroy every non-citrus fruit tree in the region, so that the pest would have nothing to live on during the seven months between grapefruit crops. But the Mexican plantings on the other side of the river still constituted a menace. These of course could not be touched by American regulations. But the Mexicans of the region voluntarily aided their American neighbors, and of their own free will destroyed all of their non-citrus fruit trees. It was, Dr. Marlatt declared, a most striking example of international goodwill and cooperation in the face of a common enemy.

A United States laboratory for the systematic study and combat of the fruit fly pest has been established in Mexico, where American entomologists work with their southern colleagues, under the leadership of Dr. Alfons Dampf, Mexican government entomologist.

The marches of the early armies of insects, in the days when there was no human race to oppose their progress in poison and traps and other paraphernalia of war, were the subject of much discussion. Their fossil chronicle in rocks a hundred million years or more in age have been read by careful human historians.

Northern Russia and Siberia had an insect fauna much like that of Kansas away back in the Permian Age, before even the dinosaurs had established their sway on the earth. Dr. Andreas B. Martynov of Leningrad reported new discoveries in the Rocks of Russia that thus linked up the ancient history of the two hemispheres. There were in those days similar species of cockroaches, dragonflies, wasps, mantids and cicadas. All these insects were of primitive types and no longer survive, but resemble their modern descendants sufficiently to be recognizable.

From the opposite end of the earth, F. W. Edwards of the British Museum brought a story of modern evidence on ancient migrations. Mr. Edwards has been collecting in the far south of Chile, in the southernmost forest of the world. There, under trees much like our northern beeches, he found insects belonging to the same genera as those of Australia, Tasmania and New Zealand. Most of this area had been unvisited since Darwin as a young man had tramped over it nearly three-quarters of a century ago. Mr. Edwards failed to find evidence there of a former land bridge connecting South America with Australia, but found some support for the so-called Wegener theory, that all the continents of the earth were once solid land mass, and that the two Americas have drifted westward, floating in a semi-liquid layer of rock beneath.

Further support of Mr. Edwards' findings was supplied by Dr. E. C. Van Dyke of the University of California, who told of the migrations of North Ameri- (*Turn to next page*)

Plague of Pharaoh—Continued

can insects, by Dr. W. M. Wheeler of the Bussey Institute, Cambridge, Mass., from his studies on the ants of South America and Australia, and by Prof. E. L. Bouvier of the Museum of Natural History, Paris, who has been working with the most primitive of all the creatures that walk the earth on jointed legs.

The myriads of tiny creeping things that live in the upper layers of the soil under the trees of the forest have changed but little in their preferences through almost uncounted ages, according to a note contributed by Dr. R. I. Tillyard, chief entomologist of the Australian government. He stated that he saw in England fossil plants from the Devonian Age, a period so remote that geologists hesitate to estimate its age in years. The plants then were utterly unlike the plants of today; yet the tiny life that crept among their tangled stems when they died rather closely resembled the life of the same habitat today not only in the families represented, but in the relative numbers of individuals.

Caterpillars and similar pests are more numerous in warm weather than in cool. That is a commonplace observation; it has remained for a German professor, Dr. H. Eidmann of the University of Munich, to find out why. He took butterflies of several different species and raised a number of each at ordinary temperatures, another lot in a cold room and a third lot in a room that was kept above 85 degrees Fahrenheit. Although all his butterflies started even so far as potential egg production was concerned, in all cases the ones kept in the high-temperature room laid the largest number of eggs.

Rising currents of air, which as all aviators know sometimes amount to strong winds blowing "straight up," frequently carry winged beings much smaller than flying men, and probably play an important role in the migration and distribution of insects. Such is the opinion of Dr. E. P. Felt of Stamford, Conn. Most insects, especially small ones, can not navigate, or perhaps more properly can not aviate, against a strong air current, and when one of these rising drafts catches them it may carry them thousands of feet into the air. Insect traps on airplanes and kites, and on the roofs of tall buildings in the middle of cities, have turned out catches of weak-flying ground

haunters that must have been carried miles from their original habitats. Dr. Felt believes that the world-wide distribution of some of the midges, which are very weak fliers, may be accounted for on the theory of these involuntary upward parachute leaps.

The traditional fickleness of a moth will be more than ever confirmed in the minds of romanticists if the scientific findings reported before the Congress ever find their way into literary circles. For Prof. John H. Gerould of Dartmouth College told how he saw the heart of a big moth reverse itself and beat backwards, and then as if to cap the climax, start its beats in the middle and go both ways at once.

Insect hearts are not very much like those of the animals with which we are more familiar. They consist essentially of an enlarged tube with muscular walls. The rings of muscle in the walls squeeze together rhythmically, and a sort of wave-like motion sweeps over the organ from one end to the other, forcing the blood along before it. Prof. Gerould is of the opinion that this apparently fickle behavior of the insect's heart is of real physiological advantage to the creature itself, however odd it may seem to a human observer.

The Congress was hailed as the most successful meeting of its kind ever held. Over 600 persons attended, including 100 foreign delegates representing some 35 countries. The halls were a friendly Babel of languages. Frenchmen spoke German to Germans, and Germans replied in French to Frenchmen. Belgians, Czechs and Russians spoke both languages to each other. There was very evidently no question of frontier or race in this meeting of the Scientific General Staff.

The next International Congress of Entomology is to be held in Paris in 1932.

Science News-Letter, September 1, 1928

Out of 260 graduates at West Point last June, 29 per cent. chose the air service.

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