

## SCIENCE NEWS

*Science Service, Washington, D. C.*THE FOURTH INTERNATIONAL CONGRESS  
OF ENTOMOLOGY

ENTOMOLOGISTS from all over the world, men who study the ways of insects in order to make war on the harmful ones and to get use out of the beneficial ones, opened the Fourth International Congress of Entomology at Cornell University on August 12. Hundreds of scientists from the United States, Canada and Mexico are meeting with the leading members of their profession from overseas countries during the coming week to exchange news and views. The present gathering is the first international congress of students of entomology to meet in the United States. The first of its kind was held in Brussels in 1910, and the second in Oxford, England, in 1912. The war, with its subsequent unsettled period, prevented another meeting until 1925, when it was held in Zurich, Switzerland. Delegates are present at Ithaca from the following countries: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Chile, China, Cuba, Czechoslovakia, Denmark, Egypt, England, Finland, France, Germany, Greece, Guatemala, Hawaii, Hungary, Italy, Ireland, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Porto Rico, Rumania, Scotland, South Africa, Spain, Sweden, the United Soviet States of Russia, the United States.

An international defensive alliance against enemies that threaten to overwhelm the human race is being discussed at Ithaca during the present week. The participants in the congress assembled there, which will break up in one week without any flourishes or signing of treaties, are not diplomats but scientists, and the enemies against which they wage warfare are not foreign soldiers. It is against insects that the members of the Fourth International Congress of Entomology will sound the alarm. It has become an axiom among scientific men that the only animal group which has not acknowledged man's overlordship, the only group which may seriously contest his place in the sun, are the six-legged little fliers and crawlers that most of us think of only as annoyances that bite our ankles, or crawl down our necks, or get into our picnic salad. Insects do much more serious things than these. They raid our crops: even to the lay world the names corn borer, army worm, Japanese beetle, Mexican bean beetle, boll weevil and a host of others sound menacingly. They attack our cattle and decimate the herds with disease; tick, botfly and tsetse all take their toll. They carry the germs of death to man himself: mosquito and fly are a deadly duumvirate, and they have a host of assistants. Not for nothing did the ancient Israelites recognize in Beelzebub, the God of Flies, the everlasting ancient enemy and destroyer. In this warfare, of which the meeting here may be likened to a conference of the general staff, there are no central powers, no allied and associated powers, no neutrals. German, Austrian, Russian, Briton, Frenchman, Italian, Czech, Slovak, Magyar, Bel-

gian, Dutchman, Dane, Spaniard, Japanese, Australian, Canadian, Argentine, American, and men from all the other nations of the world where scientific work goes on, are here to pool their resources and exchange ideas on strategy and tactics. Mankind need not yet cry out that it is fighting with its back to the wall, and the entomologists are determined that to such an evil pass things shall not come.

Entomology and lawmaking do not at first sight seem to have much in common, yet there are insects that affect legislation very markedly. Termites, sometimes called "white ants," have caused a number of communities to modify their building codes to fit, or rather to oppose, their tastes. Dr. Thos. E. Snyder, of the Bureau of Entomology, U. S. Department of Agriculture, told the Fourth International Congress of Entomology. There are over 1,600 species of termites, and most of them live on wood. And they don't care whose wood it is or where it is. Telephone poles, railroad ties, hardwood floors, antique furniture, bookcases and the books in them—they are all just provender for termites. Therefore to keep them out special types of protected building have had to be designed, and termite-proof construction is coming to be as strictly required in some cities as fireproof building.

There are two main groups of termites that cause most of the trouble in American cities. One, which does not burrow in the ground, attacks dry wood wherever it finds it. This kind can be stopped by means of chemically treated wood; or, if already entrenched, can be killed by poison gas or by heating. Furniture can be made hot enough to kill the termites without marring its finish. The second type burrows in the ground and bores into moist wood it finds in contact with it. These insects can be effectively stopped by seeing that all building timbers are kept off the ground, on dry concrete or masonry foundations or pilings. Termite-proofing a building need not add more than two per cent. to the original cost, and often saves many times its outlay in deferring replacements which these insects would otherwise make necessary in a short time.

A poultry raiser is glad enough to see one chick or duckling hatch out of one egg. He would be astonished 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, who spoke before the congress. 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 terri-

fied 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.

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 rôle 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 hunters 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 of Entomology ever find their way into literary circles. For Professor 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. Professor 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.

Similarities in the muscle structures of the legs and mouth-parts of insects and other jointed animals to those of the appendages of earthworms and their kin, are held by Dr. R. E. Snodgrass, of the Bureau of Entomology, U. S. Department of Agriculture, to indicate an evolutionary kinship between the two classes of animals. The musculature of the jaw parts of worms is identical with that of insect maxillae, while the more complicated leg structure of insects is foreshadowed by the

muscle arrangement on the locomotor appendages of worms. Caterpillars and similar pests are more numerous in warm weather than in cool. Dr. H. Eidmann, of the University of Munich, experimented with 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 86 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.

A "Yankee invasion" of Mexico to which no Mexican objects but rather welcomes, was described by Dr. Alfons Dampf, chief entomologist of the Mexican Federal Department of Agriculture. Mexican fruit growing, Dr. Dampf said, has been all but ruined by the depredations of a genus of fruit flies known as *Anastrepha*. He has devoted a great deal of his time to a study of this pest, its life and ways, in search of a weak point in its life cycle where it can be attacked with hope of cutting it down. Lately he has received reinforcements from the United States, because one species of the troublesome insect has crossed over into Texas; and an American entomological commission has been established in Mexico City, with full laboratory facilities and a staff of workers. The Mexican and American scientists are cooperating closely in their efforts against the common insect enemy.

## THE NEW GEYSER IN THE YELLOWSTONE PARK

THE greatest geyser now active in the world, and with the exception of old Excelsior Geyser, extinct since 1888, the greatest geyser of all history, burst forth into furious and explosive activity a few days ago, and since then has been under scientific observation preliminary to the opening up of a special road or trail to make it accessible to the touring public. Superintendent Horace M. Albright, Dr. Arthur L. Day, director of the geophysical laboratory of the Carnegie Institution of Washington, and Dr. Eugene T. Allen, of the same institution, together with a corps of photographers, have been conducting the investigation of the new phenomenon from the dual point of view of public administration and scientific inquiry.

The new geyser is a Titan of its kind. Its crater is a huge ellipse, 100 feet by 120 feet in its two diameters, and eight feet deep. It erupts in great explosive outbursts, hurling water in all directions and reaching an average height of 60 to 75 feet. Occasional spurts reach a height of 100 feet. It keeps this up at 15 or 20 second intervals for a total of three hours or more, and stages two of these long eruptive periods every 24 hours.

The volume of hot water it ejects is tremendous. The run-off pours through a four-foot gap to a depth of eight inches, at a rate of 120 feet per minute. When an eruption ceases the geyser crater is dry with the exception of a small fissure and several boiling mud springs along the north edge. The end of the eruption

comes as suddenly as its beginning, and the last of the violent steam explosions seems to be as energetic as at first.

The action of this geyser is so violent, its eruptions so great and its time-intervals so regular that it bids fair to become one of the park's major attractions.

### CUBA AND THE AMERICAN MAINLAND

THE theories that dry land once united Cuba with the peninsula of Yucatan and that aborigines of Cuba may have been descendants of the famous Maya race of Yucatan are being discussed at Havana, according to a Science Service correspondent, as a result of discoveries at Lake Mampoton in the province of Pinar del Rio.

A group of American naturalists and archeologists, co-operating with the Cuban naturalist, Dr. Carlos de la Torre, has made soundings and excavations at this lake and has unearthed pots and other utensils bearing designs and inscriptions like those of the Maya civilization. In the same Cuban province, Dr. de la Torre has found fossil remains of mammals of a species which still exist in Mexico, in the hills of Yucatan and Campeche.

Old Maya legends that tell of the flooding of much land support the theory that long ago these animals wandered afoot across what is now the Straits of Yucatan. Much later, when only the high land of the region remained above the sea to form the island of Cuba, it is suggested that the human migration took place by boat. It is believed that Maya chiefs who had been vanquished by more powerful chieftains fled with their people to the unexplored island to the east and there hid from pursuit.

Because of growing interest in the discoveries, further explorations of the region are now under way.

### ITEMS

No word has been heard since March from the scientific expedition which set out for the Taimyr Peninsula, one of the most remote points in northern Siberia. The expedition, consisting of Tolmachev, the secretary of the Polar Committee of the Russian Academy of Sciences, zoologist Rogosov and astronomer Malzev, set out early in the year to reach this Arctic peninsula by crossing the Siberian plains. It was the first attempt to gain the Taimyr region overland. Inquiries have been sent to all parts of the region where the expedition may be traveling. No northern radio station of the U. S. S. R. has been in communication with the radio station of the explorers. The only inhabitants of the peninsula who might aid a stranded party are a few wandering Mongols.

THE Pavlov Volcano Expedition, under the leadership of Dr. T. A. Jaggar, of Kilauea Volcano, has added a new volcano to the long string already known in Alaska. The mountain is north of Canoe Bay, and is 4,300 feet high. Its crater contains a small lake. Dr. Jaggar proposes to name the peak Dana Volcano, in honor of the great pioneer American geologist. The amphibious auto-boat which the expedition carries is reported to be a great success. It can run on land and cruise in the

water, and steel-wire mats make it possible to cross mud flats and oozy sand. It is doing full duty both on land and water in hauling freight and passengers, firewood and camp material, in trolling for fish, and in bringing down from the foothills such game as is shot; Dr. Jaggar speaks of using five bullets to kill a 10-foot bear. As a boat it is not particularly fast, but has been found very seaworthy in heavy seas and in strong currents and tide rips, and has been found able to land successfully through fairly heavy surf. On land it is taken along the beaches and over the tundra quite easily. It makes excellent sleeping quarters for two men whether on land or on sea.

At the University of Nebraska a setting is being created for the display of fossils of elephants, tortoises and armadillos many millions of years old. These were found at Niobrara in the valley of the Platte river in western Nebraska. Because of the soft sandstone in that region, parts of the bones were left visible, a circumstance facilitating the task of collecting them. The bones vary in size from the skull of a mammoth to the skeleton of a shrew, the smallest of mammals. The elephant serves as the keynote for the entire exhibit, ten different kinds of elephants having been found in Nebraska.

EVIDENCE suggesting that ergosterol is not the only substance that can be given the power to prevent rickets by exposure to ultra-violet light was presented to the Institute of Chemistry of the American Chemical Society by Mrs. Elizabeth M. Koch, of the University of Chicago. A commercial cholesterol, a substance found in nerve tissue, egg yolks and blood, was exposed to ultra-violet light. It acquired the power of preventing rickets to a high degree, proving about one seventy fifth as effective as ergosterol, which has a very high anti-rachitic potency. When the commercial product was purified its potency was not nearly so great, but heating the purified product in nitrogen under pressure raised the potency to its original degree.

FUTURE advances in the science of immunity, which is the body's resistance to disease, will be made largely by chemists, either alone or in association with immunologists, was predicted by Dr. H. Gideon Wells, of the University of Chicago, at the recent meeting of the Institute of Chemistry of the American Chemical Society. "Immunity may be appropriately called the chemical warfare of existence," said Dr. Wells. "The disease germs attack and kill us by the poisons they produce. Our bodies are constantly producing poisons to defend themselves by killing the germs. Through chemistry we can gain knowledge of just what these mysterious protective agents are, how they act and how to produce them artificially. Then we shall not have to depend on the dilute solutions of these agents that we can extract from a horse or can cause to develop in man's own blood, such as our present serums and anti-toxins, but can give man as much as he needs of the active agent that has been prepared by synthetic chemistry."