SCIENCE NEWS

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STUDY OF LOCUSTS IN PALESTINE

THE migratory locust of Africa, which is now causing wide-spread damage throughout northern Africa and the Near East, is being attacked as a major scientific problem by entomologists of the Hebrew University at Jerusalem. Recent studies by Drs. F. S. Bodenheimer, G. Fraenkel, K. Reich and N. Segal have contributed new facts which will eventually be of use in conquering this age-old bringer of desolation and famine.

Although the locust is about the oldest of recorded insect pests, strangely enough very little positive knowledge has been gathered as yet regarding its biology, habits and primary breeding places. One of the first things developed by the investigators at the university has been definite evidence that the locust is not strictly an insect of the desert, as has usually been supposed. There are strong indications that the primary breeding ground of the insects that make trouble in Egypt, the Sinai region, Transjordania and Palestine is in the moderately moist borderlands of the desert, and that a bad locust year is almost always preceded by a decidedly rainy winter, giving the ground where the eggs are laid plenty of water in its upper layer. This hypothesis is supported by evidence gathered by earlier workers in the Sudan and elsewhere.

Studies both in laboratory and field indicate that the eggs are not formed in the body of the female locust until spring. After they are laid in the ground the young insects inside the shells require from two to four weeks before hatching. While they are passing through their five larval stages, growing larger each time they shed their skins, they begin their migratory march. In six or eight weeks they have become full grown winged adults, and their migrations become the vast flights that darken the sun and strip fields and orchards bare. Their adult life seems to last about ten months, completing the year's cycle.

Locusts are decidedly insects of clear sky and hot sun. They avoid the ground and the stones upon it during the chilly hours of night, roosting on the vegetation, especially on shrubs. When the first signs of dawn appear they hop down to earth, and creep about in small clumps until the first direct sunlight reaches them. Then they stop and sun themselves for a time, standing broadside on, to get the full benefit of the early rays.

As the day warms up, the horde begins its march. It keeps relentlessly ahead, climbing over all natural obstacles and not diverting from its set course even when an easier route presents itself. If the weather is very hot, the insects stop for a siesta at midday, this time turning their bodies so as to expose as little surface as possible to the sun, or taking advantage of all chance patches of shade. On resuming march in the afternoon they feed voraciously, cleaning everything bare where they stop for lunch. Late in the afternoon, when the temperature falls, they call a halt, again sunning themselves, seeking dark stones for warmth whenever possible. Then they climb the shrubbery for the night.

These reactions seem to be governed by temperature rather than by light, for it has been found that when the weather is very warm they will march all night. Locusts are decidedly warm-weather creatures. At all stages in their lives they like high temperatures, thriving best when the mercury stands so high in the tube that human beings are distinctly uncomfortable.

COTTON PREDICTIONS

FICKLE weather and the boll-weevil have been made to tell as early as the first of September almost exactly how much cotton will be harvested in United States during the following fall months.

Just how these predictions can be made, based on the weather reports from hundreds of stations throughout the cotton belt, was made public for the first time by J. B. Kincer, chief of the division of agricultural meteorology of the U. S. Weather Bureau, at the recent meeting of the American Meteorological Society.

The method which Mr. Kincer and his associates, W. A. Mattice and Miss G. B. Diehl, have worked out during the past two years will give cotton growers, buyers and investors accurate information on production far in advance of the harvest and should enable them to sell and buy more profitably. Calculations have been made of estimated and actual production since 1909 with an accuracy of approximately ninety-seven per cent.

For the bumper crop year of 1926 the actual production was almost exactly the same as the predicted. In 1921, the year of smallest yield, an error of seven per cent., the largest of the 20-year period, was made. For 1928 the prediction was only three per cent. less than the actual production.

To make the calculations, Mr. Kincer used weather information such as amount of rainfall, number of rainy days, relative humidity, amount of sunshine, and average, highest and lowest temperatures. Weevil damage is estimated from the weather of the preceding summer, which determines the number of insects that hibernate during the winter; from the severity of the winter, because many might be killed by the cold, and from growing season weather, as dry weather keeps the weevil in check and damp weather greatly increases his family.

From this information a weevil index is worked out by mathematical relations to be combined with the weather-yield relation for the final result. The predictions can be made for each state as well as for the entire cotton belt.

This is the first study of cotton prediction for the cotton belt as a whole made on combined weather and weevil effects. Details of the method are to be published in technical journals.

A MADAGASCAR RUBBER PLANT

A RUBBER plant that yields strips of pure rubber from cuts in its rind, and is able to grow in the driest desert, is now thriving in Washington. Cuttings brought back from Madagascar by Dr. Charles F. Swingle, of the U. S. Department of Agriculture, are being propagated as rapidly as possible, so that they may be transplanted out of doors in the Southwest and in other warm parts of the country, to test their rubber-yielding qualities under American conditions.

The plant was famous a little over a generation ago, when it caused a veritable "rubber rush" in Madagascar. The rubber export from the island jumped from 50,000 pounds to over a million pounds a year. Then, due to crude methods recklessly employed in gathering, the wild plants were practically wiped out, and not until Dr. Swingle went to Madagascar in company with the French botanist, Professor Henri Humbert, of the University of Algiers, were they rediscovered.

The plant is a large bush or small tree belonging to the euphorbia family, of which poinsettia, castor bean and the Para rubber tree are well-known representatives. It is known to botanists as *Euphorbia intisy*. The second name is one of the native Malagash words used to designate both the plant and the rubber taken from it.

One of the most remarkable features of the plant is the thoroughness of its adaptation to desert life. Real desert plants are usually organized to offer stubborn resistance to desperate environments, and the intisy is one of the best-organized desert plants known. Its leafless, switchlike stems, coated with wax, yield very little water to the demands of the arid air, and the gum that forms in every wound effectively stops bleeding of sap. Finally, intisy has one of the most efficient of water reservoirs, stowed safely underground on its roots. Dr. Swingle states that no other plant has anything quite like it.

Each root is thickened in a series of sausage-like swellings, and practically the whole of the enlargement consists of water. The water is stored in swollen-up cells with which each "sausage" is filled. It is good water, too—the very slight "planty" taste did not deter Dr. Swingle and his party from slaking their thirst on these roots, in preference to the very poor drinking water usually obtainable at the desert water holes. He has given the structures the special name "hydriarhizas," which means "water-jug-roots."

AN INTERNATIONAL WILDERNESS AREA

A GREAT stand of virgin forest, dotted throughout with hundreds of lakes, will be preserved as a great recreational area, if the Shipstead-Nolan bill now pending is passed by Congress.

This wildwood region, abounding with fish, game, natural camping sites and beautiful scenery, is partly in northern Minnesota and partly in adjoining Canada. It includes in its area the present Superior National Forest, but takes in much more territory.

The interior lakes are in many instances connected by channels containing rapids and waterfalls. A hardened camper could make his way with a canoe and a pack. But it will be no place for the average tourist to go in his automobile, even though one can reach the heart of it in twenty-four hours after leaving Chicago. The railroad does not go into the area and the automobile highway touches only on its fringe.

Legislation to preserve this region for posterity is necessary because of power development which certain industrial interests would bring about, particularly on the boundary waters between Minnesota and Canada.

Certain timber will be cut in the area under the direction of the governments concerned, but water levels of the lakes must not be changed, except temporarily for logging purposes.

The Canadian area is part of the Province of Ontario and is known as the Quetico Provincial Park. At present there is more wild game on the Canadian side than on the American.

THE CALMETTE SERUM

THE Calmette-Guérin method of antituberculosis inoculation of new-born infants, which has recently resulted in a number of deaths in a German baby asylum, is not used in the United States. American physicians in general have not advocated the method as have Continental doctors. Those American physicians who have favored it have advised a period of trial on animals before using it for human infants.

The method was developed by Drs. A. Calmette and C. Guérin, of the Pasteur Institute, Paris. A kind of half-starved strain of tuberculosis germs from cattle is injected into the infants during the first few hours or days of life. The germs are supposed to have lost their disease-producing power, but to have retained the faculty of producing immunity or resistance to the disease. The originators of the method claim that it gives the babies protection against tuberculosis to which they may later be exposed.

The method is claimed to be particularly suited for the protection of children, born of tuberculous parents, who would be continuously exposed to the disease during the first year of life, before they have a chance to acquire any immunity or resistance to it.

The method has been used at various European centers and even in Indo-China. At Luebeck, Germany, the deaths of 17 infants following the inoculations are being investigated by health authorities. Well over 50,000 infants born into tuberculous households have been inoculated in France. The mortality among these children is very much less than among other French babies who do not receive the inoculations and who are exposed to the disease in their homes.

Professor C.-E. A. Winslow, of the Yale School of Public Health, recently advised that the method be given a thorough trial of animal experimentation in this country. Dr. M. H. Soule, of the hygienic laboratory of the University of Michigan, was even more enthusiastic about the method after visiting Dr. Calmette's clinic in Paris. Other American scientists, among them Dr. S. A. Petroff, of the Trudeau Sanitorium, Trudeau, N. Y., and

Dr. Ralph Mellon, of the Western Pennsylvania Hospital, Pittsburgh, have warned against the method.

THE RADIO BEACON

Two vibrating white reeds on the instrument boards of New York-Cleveland mail planes will soon paint an air path visible in fog, rain and snow over 250 miles of the worst flying terrain in the United States, it is announced by Clarence M. Young, assistant secretary of commerce for aeronautics.

This visual radio range beacon to be installed during the next few weeks will supplement the aural type radio range beacon that has been in use at Bellefonte, Pennsylvania, in the Appalachian mountains for more than eighteen months, and if it proves satisfactory will probably replace the aural beacon and be extended to other parts of the country. Its installation is necessitating expensive changes in transmitting equipment and the addition of a reed box to the planes. The apparatus is a joint development of the U. S. Bureau of Standards and the aeronautics branch of the Department of Commerce.

The aviator tells whether he is on the right path by watching two white reeds vibrate. If the reed on the left vibrates most, he has veered off to the left of his course. If the amplitude of the right-hand reed is greatest, the plane is too far to the right. When both vibrate alike the plane is on its true course.

The aural beacon system now in use gives the same information by coded signals picked up in the head phones. Great concentration is required of the pilot and he must wear the phones practically all the time.

Neither beacon system makes unnecessary the searchlights which are installed at 10-mile intervals. When the weather is open the lights can be followed, but when the aviator must go for miles through fog, rain or snow which completely hide the ground and lights, he has to rely on the beacon to keep him on his course. A recent test flight from Detroit to Washington through bad visibility was made almost entirely by beacon signals and not by maps.

The path of the beacon will bring the pilot close enough to the landing field for him to see the ground lights and make a descent by sight. No effort is to be made at the present time to put in practice "blind" landing as accomplished by Lieutenant James H. Doolittle for the Guggenheim Fund.

ITEMS

THE release of eight persons who have been cured of leprosy at the National Leprosarium at Carville, La., has been announced by the U. S. Public Health Service. The apparent cure of these eight patients, in addition to some sixty others released within the last eight years, represents further proof of the efficacy of the treatment with chaulmoogra oil as it is now carried out at the National Leprosarium, which is under the direction of the service.

ETHYL gasoline has been given a good bill of health in Britain, provided its handling is attended by ordinary precautions. The questions raised regarding its safety have been investigated by a departmental committee on ethyl petrol, which has just issued its final report. The committee worked along lines somewhat similar to those followed in the earlier investigations in the United States, taking into consideration the results of the American experiments. The aspects of the tetra ethyl lead problem on the committee's agenda included danger from lead in street fumes and dust, spillage on the skin, and evaporation and combustion fumes in closed garages. Danger of lead poisoning in the latter case was considered to be considerably less than the well-recognized menace of carbon monoxide.

CARSICKNESS, a kind of seasickness which some people suffer from riding on street cars, does not result from the rider's looking out of the window, as has been popularly believed, Dr. James E. Lebensohn, of Northwestern University, reported to the American Physiological Society. The illness is caused by the disturbance of the labyrinth of the ear due to the jarring of the car. In his experiments subjects in the laboratory were able to follow a moving object which caused their eyes to move back and forth for hours without suffering any nausea. But when the up and down motions and slight jars of a moving car were reproduced in the laboratory, the carsickness resulted. The same condition was produced when the labyrinth of the ear was stimulated by electricity, so that the fluid in the semicircular canals of the ear was continually disturbed.

YEASTS have been makers of alcohol for many millions of years. Their cells have been found in rocks older than the Coal Age and infinitely older than the times of the dinosaurs by Professor Johannes Grüsz, of Berlin. With them in many cases were tiny bubbles of carbon dioxide gas, the same stuff that makes the "bead" on home brew. Professor Grüsz found the yeasts as an incident in his search for the oldest fungi in the world; yeasts are a specialized form of fungi. The other fungi which he found, in rocks of Devonian age, were parasites on the primitive plant life of those days. They infested their stems and fruiting bodies, breaking down the cells and feeding on the tissues, as parasitic fungi do to farmers' crops and foresters' trees to-day.

A PARALLEL for the old American tale about owls and rattlesnakes living in the same burrow has been found in New Zealand. Only the rattlesnake-owl story is now doubted by naturalists, while the new find is attested to as genuine by a correspondent in *Nature*. On eight or ten groups of islets near East Cape, North Island, N. Z., there are numerous tuataras, a strange lizard native to these islands. The same islets are inhabited by colonies of petrels, who nest in burrows in the ground. In many cases the burrows of the petrels are shared by tuataras during the nesting season, while in winter, after old and young petrels have departed for the north, the lizards hibernate in the burrows. Both petrels and lizards sleep during the day, departing at dusk to seek food. While a lizard may occasionally devour a solitary chick of the petrel, in general he lets it alone.