SCIENCE NEWS

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THE MEXICAN BEAN BEETLE

FOR the first time in its history as a pest, the Mexican bean beetle has passed the natural barrier of the Appalachians, providing a serious and immediate threat to the Piedmont and coastal plain regions.

The insect's spread this year, according to the U. S. Bureau of Entomology, has been greater than since its initial eastern appearance in northern Alabama in 1920, when it began an alarming, fast-moving migration northward and eastward.

While this year the destroyer has made few serious inroads into the South, it has overrun the greater part of Maryland and Virginia for the first time and spread 105 miles eastward, reaching North Carolina. The states of New York and Michigan were also invaded for the first time, the former in the southwestern corner and the latter in the southeastern corner. In Pennsylvania, virtually a third of the entire state suffered depredations, notably the section from Tioga City to Lancaster County. This summer's spread is attributed partly to the mild, cool weather, favorable for the development of the larvae.

Besides the common garden bean, the insect attacks the pole bean and the pole lima. Thus far it is not a destroyer to any degree of the soy bean and the cow pea, except in instances where the hungry hordes run short of their favorite beans.

Government control methods have included the introduction of parasite flies from Mexico and the use of arsenated sprays and dusts. This year one of the tiny tachinid flies was introduced, but soon was abandoned, partly because of inadequate knowledge of the insect's life cycle and because indications were that the Mexican bean beetle has virtually no natural enemy important enough to really check its multiplication. Moreover, adult parasite flies tend not to survive our rigorous winters.

Magnesium and calcium arsenate compounds are being used widely as control measures. Fortunately, unlike the wily Japanese beetle, the Mexican beetle needs no lure to persuade him to eat plants containing death-dealing poisons. Meanwhile government technicians are seeking control methods less poisononus and laborious than dusting and spraying.

THE EFFECT OF ALCOHOL ON RATS

SCIENCE is doing its best to ascertain the effects of alcohol on the living system. Dr. Frank Blair Hanson, assisted by Miss Florence Heys, of Washington University, has been conducting an alcoholic experiment with ten generations of white rats that if translated into human years and generations would have covered a period of approximately 500 years.

The rats, all descendants of a single pair of identical ancestry, were divided into two groups. One set was kept under normal laboratory conditions while the others, beginning at 20 days of age, were put into an air-tight fume tank over evaporating alcohol. They were left in this alcohol-saturated atmosphere until they were all completely "drunk."

"The first effect of the alcohol," says Dr. Hanson in a report of the experiment that will appear in a forthcoming issue of *The Journal of Heredity*, "was to stimulate the rats to great activity. This exhilaration soon passed, however, and was followed by a period of sullenness and quarrelsomeness. The last period of the treatment was characterized by increasing drowsiness ending in unconsciousness. At this point the rats were removed from the tanks. It often took several hours for the animals to sleep off the effects of the intoxication.

"The direct effects of the alcohol was disastrous in the extreme. The rate of growth was considerably slower in the alcoholic rats than in their untreated brothers and sisters. There were cases of paralysis and gross tremors. The normally white, well-groomed coats of the animals became discolored and unkempt. In appearance they were thoroughly degenerate.

"The eyes of the treated animals exhibited the most striking abnormalities. After only a few treatments many of them became totally blind. By the time the alcoholic rats were mature and mated nearly all were blind."

But of the 1,688 young born to the alcoholic parents throughout the ten generations only one was born with defective eyes, while among the control animals two defective-eyed animals appeared. Descendants of the blind rat of alcoholic ancestry had normal eyes indicating that alcohol is powerless to induce hereditary eye defects in the white rat at least. A small proportion of the descendants of the blind rats of control group had defective eyes.

"It seems," said Dr. Hanson, "that in almost any species a certain small percentage of defective individuals will be produced. In order to demonstrate the inheritance of induced eye defects or other abnormalities it will be necessary first to know the normal rate of production of spontaneous defects in the stock employed and then significantly modify that rate by alcohol or other deleterious agent."

SCIENTIFIC TRAINING FOR DENTISTS

LOOKING forward to better and more lasting teeth for future generations, Dr. Henry L. Banzhaf, of Milwaukee, Wis., president of the American Dental Association holding its annual meeting at Detroit, declared that dentistry should be put on a sounder research basis.

"Upon the development of research depends the future progress of our profession," Dr. Banzhaf said. "The reason that there are not more persons who have the training and inclination to do research work lies in the fact that the dental schools have either neglected graduate work entirely or have confined their interest along

that line to superficial short courses. The remedy for this serious shortcoming lies in the reorganization of our undergraduate dental work to the end that it will be based on a proper preliminary training of not less than two years of prescribed liberal arts college work.

"Until graduate and research work in our dental schools is organized on a proper logical, scholastic basis, we have little to hope for in research at these institutions. Indications, however, point to an early recognition of this deficiency on the part of universities conducting dental schools and the not distant future will see many of our educational institutions reorganized for graduate instruction in dentistry and provided with adequate funds, just as they are already organized and provided for in other branches of learning."

Dr. Banzhaf commended the recent bulletin issued by the Carnegie Foundation of which he said: "The effect of the study of dental education by the Carnegie Foundation which was recently published is already a foregone conclusion. The *Bulletin* will do much to impress the importance of dental schools upon the chief executives and regents of certain universities who have not yet realized the true significance of dentistry as an essential part of health service. It will also stress the need of dental schools in the appreciation of those citizens who are philanthropically inclined and who desire to donate funds for the purpose of aiding dental education. Last year contributions to medical schools amounted to $100,000,000."

POTTERY FROM TLAXCALA

AMONG the most beautiful pottery made by people in America before the coming of the Spaniards is the pottery of Tlaxcala, in Mexico, says Dr. Eduardo Noguera, of the Mexican department of archeology. Dr. Noguera, who has been excavating an Aztec temple near the town of Tlaxcala, has found a number of specimens of the ceramic art of that race.

The typical Tlaxcala pottery is distinguished by its extreme hardness and its red color. It is made of well-mixed clay and is better baked than most pottery of other regions, he said.

The Mexico City museum collection shows that the deft Tlaxcalan potter made plates and cups, pots and pans with supports, jugs with handles and bowls and dishes with almost flat bottoms, and cups with snouts. There are some vessels in the form of the human foot and others in the shape of various animals.

Most of the pieces have red or yellow foundations upon which are painted designs in yellow, red, white, gray or black. Pyramid figures are common symbols used in the decoration and there are also human figures, emblems of gods, men, animals, plants and portions of the anatomy such as hands, skulls and hearts. The patterns are highly conventionalized and show easy skill.

Some of the vessels are embossed with human or animal heads which serve as handles. Grotesque heads of humans, birds or snakes are used as the feet of vessels.

The Tlaxcalan pottery appears to be a link between the ceramic art of the Mayas of the south and the races further north, Dr. Noguera says. Examples of Tlaxcalan pottery are found so widely scattered over distant parts of Mexico that it is thought that it was valued highly for its beauty and perhaps served as a medium of exchange.

AVIATION WEATHER PROBLEMS

AVIATION'S rapid advance has created such a demand for weather information and research upon the weather hazards of flying that a committee of meteorologists is now considering how flying can be better served by the science of meteorology.

The committee is sponsored by the Daniel Guggenheim Fund for the Promotion of Aeronautics and is headed by a young Swedish meteorologist, Carl-Gustaf Rossby, who has been carrying on special researches in this country. The other members, who represent branches of the United States Government concerned with aeronautics, are Willis R. Gregg, of the Weather Bureau; Thomas H. Chapman, of the Department of Commerce; Major William R. Blair, Signal Corps, U. S. Army, and Lieutenant Francis W. Reichelderfer, Bureau of Aeronautics, Navy Department. The committee has its headquarters at the Weather Bureau, in Washington.

Though it has existed only since the end of July, the committee has already embarked energetically upon its duties. One of its first steps was to undertake a survey of the present status of meteorological instruction in the United States. It is a well-known fact that the tendency of educational institutions in this country has been to slight meteorology. The relatively few courses offered in this subject deal, as a rule, with its superficial aspects rather than with fundamentals. The committee recently addressed a questionnaire to leading universities and technical schools concerning the amount and character of the instruction now given in this field. As soon as an analysis of the replies has been made the committee will draw up recommendations looking to the more adequate teaching of meteorology in American institutions.

Pending the desired improvements in this respect, the committee has outlined a plan for courses of instruction in aeronautical meteorology to be given at the central office of the Weather Bureau. If this plan receives official approval, a number of the younger employees of the bureau, who have had sufficient preliminary education, will be assigned to attend the classes, and it is likely that qualified persons not connected with the bureau will also be permitted to attend. A tentative program of courses has already been drawn up.

On recommendation of the committee the Guggenheim Fund has made a grant to cover the cost of preparing a report on existing knowledge of fog and haze, especially as bearing on the prediction of these conditions for the benefit of aviators. H. C. Willett, of the Weather Bureau, will be sent abroad for a year to prepare the report, and will spend about half of the period at the Geophysical Institute, Bergen, Norway.

ANTI-FREEZE MIXTURES FOR AUTOMOBILES

WHAT to place in auto radiators to keep them from freezing is the problem that auto owners must now consider. Freezing nights will soon be here. Shall it be alcohol, glycerine, glycol, chlorides or some other suggested chemical? Careful studies of the advantages and disadvantages of the anti-freeze solutions suggested have been made by experts.

The two common alcohols, denatured ethyl alcohol, and poisonous wood alcohol or methanol, are the most easily available and cheapest anti-freeze agents. Denatured ethyl alcohol is used to the extent of some 40 million gallons a year as an anti-freeze. Its principal disadvantage is that it evaporates and is lost, causing the radiator to need constant refilling. Its cheapness makes up for this waste.

There is one important disadvantage common to both alcohols. When cars are finished with Duco or some other cellulose lacquer, alcohol must be used with great care or not at all as the spilling of even a small amount of alcohol radiator solution will dissolve and ruin the finish. Denatured alcohol is usually preferable to wood alcohol in spite of the fact that 10 per cent. less wood alcohol is required for protection against freezing at any given temperature. Wood alcohol has poisonous fumes and it sometimes contains free acids which will damage the radiator.

Glycerine is a favorite anti-freeze especially with those who have lacquered cars. Glycerine is more expensive than alcohol, but it does not evaporate very readily and one filling of the radiator should last a whole season if the radiator is free from leaks. Either the colorless chemically pure glycerine or the yellow distilled commercial grade can be used with safety, but the crude product is dangerous because it usually contains salts that corrode the radiator.

When placing either alcohol or glycerine in the radiator do not fill it above two inches from the top of the overflow pipe since the solution will expand when the radiator warms up. Mixtures of alcohol and glycerine are often used as a compromise between the cost of glycerine and the volatility of alcohol.

A relatively new anti-freeze compound that is beginning to be available in sufficient quantity is the chemical, ethylene glycol, made synthetically from petroleum. It has advantages of both alcohol and glycerine and costs about as much as glycerine. It does not affect lacquer finishes, flows easily, does not evaporate and lowers the freezing-point of the solution more effectively than alcohol. It is considered by some chemists to be an ideal anti-freeze compound.

Calcium and magnesium chlorides have been widely sold under trade names as anti-freeze compounds. Their serious disadvantage is that they corrode and cause serious damage to the engine jacket and radiator, particularly aluminum and solder. A soluble chromate added to them tends to prevent this corrosive effect except upon aluminum and this chemical is contained in some of the salt mixtures on sale.

Sugar, honey and glucose are condemned on the grounds that they do not lower the freezing-point sufficiently and are too viscous. Lubricating oil is also ineffective as a radiator solution because of its low heat capacity and high viscosity, while kerosene is dangerous due to inflammability, danger of overheating and its solvent action on rubber.

ITEMS

AIRPLANE attacks with poison dust, similar to those used in the American cotton belt against boll weevil, are being tried by the Canadian forest service to check the spruce budworm, one of the most formidable insect enemies of the evergreen forests of the West. The planes used are of the same type as those used in the cotton work, and the method of attack is similar. The aviator flies low over the tops of the trees, and releases finely powdered calcium arsenate and lead arsenate from a hopper. The wind from the propeller swirls the poison dust out into a swath a hundred feet wide, which settles into the trees and gives the foliage a thin protective coat. If this year's tests show the method to be economically feasible, work on a larger scale will be undertaken next season.

CARBON monoxide poisoning from automobile exhaust gas is cited as a potential factor in the ill health of city children, by Dr. J. C. Sinclair Battley, of Detroit, in a forthcoming issue of *The American Journal of Public Health*. Children are exposed to a great deal of exhaust gas. In apartments on main thoroughfares where traffic is heavy, children are subjected to a constant stream of diluted exhaust gas rising from the lower stories through the building for a considerable part of the day. The poisonous effect is difficult to estimate because of the multiplicity of factors involved, but prolonged observation may bring substantial proof. In view of the fact that chronic poisoning has been observed in adults, there seems no reason why it may not be a factor in the ill health of children.

DRS. J. S. BOLIN AND S. J. HOLMES have examined the records of 2,074 alumnae of the University of California graduated between the years of 1874 and 1910 and in a report shortly to appear in *The Journal of Heredity* they state that of these 1,160 were married and 914 were unmarried, this proportion being roughly the same as that known to obtain in several other colleges and universities. Investigation of the scholarship records showed that contrary to general expectation the grades of the married ranged a shade higher, .008 of a point to be exact, than those of their still unmated sisters. The girls who made the honorary society Phi Beta Kappa, awarded to students of high scholarship, were divided about fifty-fifty among the ranks of the married and the single.

THE American Eugenics Society, in continuation of its policy of showing an eugenics exhibit at state fairs, this year fitted out a Ford truck, purchased an exhibition tent, and employed Mr. William C. Palmer as manager. The exhibit was shown at nine fairs throughout New England.