ENTOMOLOGY

Aphids Pose Problems For Farmers, Researchers

➤ UP TO 10 MILLION aphids a day may emerge from a one-acre bean field during epidemic conditions, Dr. Knud G. Swenson, professor of entomology at Oregon State University, reported.

The tiny insects drift with the wind, feeding on a wide variety of crops and spreading several types of virus. During its 12-day life span, a single insect may drift for miles and infect hundreds of plants with disease viruses, he said.

Beans, barley, peas, strawberries and potatoes are crops most heavily damaged by aphid-borne viruses but almost all cultivated plants are affected to some extent.

Insecticides are ineffective because wind-carried aphids from untreated fields frequently infect sprayed crops before being killed.

Virus-resistant plant varieties have been used with some success, but since most crops are susceptible to many diseases, it is often impractical to develop a plant that is resistant to all aphid-borne viruses.

In order to develop more effective weapons for controlling aphid damage, Dr. Swenson is studying the varying ability of insects to transmit virus and the difference in the resistance of plants to virus.

Experiments so far point to environmental changes, but how differences in light, temperature and humidity combine to produce periodic epidemics is not known.

Under field conditions, so many variables enter the experiments that researchers cannot tell which forces are responsible.

In an attempt to sort them out, Dr. Swenson is working with "programmed environment," artificial conditions where temperature, light and humidity are carefully controlled.

When the effect of each variable is learned, it will be plugged into a simulated natural environment to learn the combination of conditions which produces epidemics, and how controls may be best developed.

His work is part of the OSU Agricultural Experiment Station program.

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SOCIOLOGY

Drug Usage May Explain Racial Gap in Deaths

➤ A STRAIGHTFORWARD new theory to explain why high blood pressure kills more Negroes than whites has been proposed by a University of California sociologist.

Most Negroes simply do not have access to expensive drugs and other medical care available to Caucasians.

The argument is advanced in an article by Dr. Jan Howard, research sociologist in the university's center for the study of law and society at Berkeley in the Milbank Memorial Fund Quarterly.

It has been known for several decades that the Negro death rate from high blood pressure, or hypertension, has been greater than that for whites. But a widening of this death rate gap since 1949 appears to be caused by what Dr. Howard calls "differential drug usage."

She reached this conclusion after her statistical analysis of death rates from this disease.

She stressed that her findings are not proof, but are the best theory so far to explain why deaths from this malady are dropping more among whites than Negroes in recent years.

Only in the past 17 years has medical science been able effectively to combat this disease, and this has been through newly developed drugs, Dr. Howard said.

During the period she studied, which ran from 1949 to 1957, hypertension death rates fell for both racial groups, but much more sharply among whites than Negroes, she found.

During the nine-year period studied, this difference in the death rate widened in favor of the whites among both sexes and all age groups.

This is dramatically seen in the 35 to 44 age bracket for females.

In 1949, 10 times as many Negroes per unit of population in this group died from hypertensive heart disease than whites. By 1957 this ratio had climbed to nearly 20. These differences became less pronounced with advancing age.

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GENERAL SCIENCE

Solution for Junk Car Problem Suggested

➤ THE JUNK CAR problem will not be solved by hiding the automobiles, the Senate Subcommittee on Public Roads was told in Washington, D.C.

"If old cars are a blemish on our land, we must treat the disease, not the symptom," said Harry Marley, Syracuse, N.Y., president of the Institute of Scrap Iron and Steel.

In commenting on bill S. 2084, which proposes that junkyards be screened, Mr. Marley told the Subcommittee that industrial zones should be exempted because landscaping of junkyards will not change the character of areas in which factories, cement yards, rendering plants and other industrial installations are located.

There is no question that every junked car by the roadside could be removed and processed for steel mills by existing scrap processing machinery, he said. New shredding machines now in operation alone can process a million cars a year.

The problem is that the mills "have reduced their reliance on scrap as a raw material," he pointed out. "The price being paid today is not high enough in many areas to allow the processor to go out extensively for cars."

The "ultimate and only lasting solution of the problem is getting more old cars into the scrap cycle faster and in larger numbers than before."

"Go beyond the narrow confines of mere beautification," he said, "to study the roots of this problem."

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IN SCIEN

PUBLIC HEALTH

UCLA Meteorologist Sees Civilization Suffocating

➤ A CENTURY FROM NOW, when every citizen of the world drives a car, the air may be so poisoned that civilization will be suffocated.

This real possibility was foreseen in Los Angeles by Prof. Morris Neiburger, a prominent meteorologist and veteran analyst of air pollution problems at the University of California at Los Angeles.

"Only after the air has been polluted to the point where it will be extremely difficult and expensive to take counter steps will the public be aroused to demand that something be done," Dr. Neiburger said.

The brighter view "is based on the unlikely premise that humans will at some time in the near future take stock of their relationship to the natural resources on which the very existence of human life and civilization is based."

The stock-taking will require abandoning the gasoline-powered car, says Dr. Neiburger, who believes it will not be possible to devise controls for internal combustion engines that will reduce the noxious effluents adequately.

An alternative might be the electric-powered automobile, carrying a battery pack the size of today's gasoline tank. About every 200 miles, the battery would be replaced with a freshly charged one at a service station, with the driver paying the cost of charging the battery, plus part of the depreciation.

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ZOOLOGY

Polar Bears Leaving Land In Evolution to Sea

➤ THE GREAT WHITE polar bear is swimming his way home to the sea, but it will take a few million years.

In a long, slow process of evolution, the polar bear is turning its back on land and returning to the place where all life began, the ocean, Dr. Martin W. Schein of The Pennsylvania State University reported.

The polar bear, *Ursis maritimus,* unlike most mammals taking a swim, does not use its hind legs to kick while in the water, Dr. Schein told members of the American Institute of Biological Sciences in Urbana, Ill.

The bear uses its feet as a rudder, as a whale uses its tail, said Dr. Schein, who has been studying the sea-going bear on Spitzbergen Island near Norway at the edge of the Arctic Ocean. In the slow evolutionary process, the hind feet may eventually become a tail.

Other mammals that have evolved from the land back to the sea include the whale and the walrus.

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CE FIELDS

ENTOMOLOGY

Grasshoppers Can Learn To Mimic Others' Songs

➤ GRASSHOPPERS can learn to imitate the songs of other grasshoppers.

This surprising discovery was made in what Charles Darwin more than a century ago termed a "fool's experiment," so called because it is one in which the "foregone conclusion stands to reason" and therefore only a fool would bother to test it.

Darwin often found such conclusions false, thereby proving he was not a fool. W. B. Broughton of Sir John Cass College in London was convinced that no element of learning existed among grasshoppers until he put various pairs together and recorded their songs.

The recordings showed that one species of grasshoppers influenced the sounds made by another species. Mr. Broughton found that this effect occurred in at least ten species. He is still analyzing results of influence between other species.

The significance of the existence of such an ability is not known, Mr. Broughton reported in the New Scientist, 27:338, 1965.

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MILITARY SCIENCE

Chemical Agents May Decrease War Savagery

➤ THE UNITED STATES should take another look at the possibility of using chemical and biological agents to lessen the savagery of guerrilla warfare in Viet Nam, Dr. Richard L. Kenyon suggested in Chemical and Engineering News 43:7, 1965.

"Chemical warfare has been engulfed in a haze of horror through propaganda and ignorance; yet it could likely mitigate dreadful aspects of what we read about in news stories from Viet Nam," Dr. Kenyon said in an editorial in the journal. "In the midst of some of those reported actions, any of a number of militarily effective chemical agents would have been less atrocious."

The abolition of war is one of man's most pressing goals, but where war exists reason and knowledge ought to be used in any way possible to reduce its awfulness, Dr. Kenyon said. Excluding arguments over whether the United States should be active in the Vietnamese war, he stated, "There is some worth in arguing for more forthright use of chemical and biological agents in the guerrilla warfare now going on."

"In the cave and tunnel warfare of the jungles there seem to be significant but little-tested possibilities for the use of well-tested riot-control agents and other incapacitating agents," Dr. Kenyon continues. "They produce temporarily disabling respiratory and eye irritation and nausea. These are sublethal, in the sense that they do not normally cause death or permanent damage, but it appears that they could produce needed results.

"To flush all parties out of protective hiding, temporarily unfit for combat yet able to return to their previous state of health, seems a desirable alternative to the indiscriminate slaughter that comes of throwing grenades into caves where there may be not only enemy guerrillas but also civilians including women and children....

"A frequent argument against mild chemical agents—other than the reaction of blind horror in ignorance—is based on the fear that they will lead to use of increasingly vicious products. In the light of comparable possibilities with missiles and explosives, this seems, on the twentieth anniversary of Hiroshima, a doubtful argument."

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PUBLIC SAFETY

CAB Boasts High Score In Solving Crash Puzzles

➤ AS PIECES of a tragic puzzle slowly washed to the shores of Lake Michigan near Chicago, a team of Civil Aeronautics Board (CAB) "crash detectives" was already in action.

The vital pieces of wreckage from the Boeing 727 jet airliner that went down in the lake with 30 persons aboard is getting a thorough examination by CAB investigators.

Out of the grim debris, from smashed instruments to engines, the CAB experts will carefully extract the "probable cause" of the crash, so that others can be prevented. Previous crashes have been traced to lightning, bombs and even birds.

The CAB is an independent agency, created by Congress to carefully watch over air safety, among other things. Its staff investigates every serious accident of any aircraft. Although its technical experts do not always solve the puzzle, CAB has claimed 96% success in finding the "probable cause" of all cases investigated in the past 10 years and 94% in its more than 25 years of operation.

The on-the-scene phase of the crash investigation takes from a week to a month. This is followed by laboratory testing of wreckage and bodies, if required. Sometimes the investigation takes years, but in most cases it pays off.

One of CAB's many life-saving studies that paid off was an investigation following a DC-6 crash near Bryce Canyon, Utah, in 1947. Before the doomed plane dropped, the pilot radioed that a fire was burning in the baggage compartment.

Gathering the debris, the CAB "detectives" suspected that flares carried in the baggage compartment could be a factor and immediately ordered all DC-6's to remove their flares.

Less than three weeks later another DC-6 had a baggage compartment fire, but with no flares to feed it the crew got the fire under control. Soon thereafter the investigators did some more research and found out just how the compartments were catching fire.

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ZOOLOGY

White-Throated Sparrow Knows Neighbor's Pitch

➤ A BIRD RECOGNIZES its neighbor mostly by its pitch, or highness or lowness of its song notes, according to Drs. J. B. Falls and R. J. Brooks of the University of Toronto, Canada.

Many birds defend their chosen home territories by singing during the breeding season, the zoologists said at the 16th annual meeting of the American Institute of Biological Sciences, Urbana, Ill.

Contrary to what poets write, birds do not sing just for the joy of life, but to warn off other birds from their chosen territory.

For example, each male white-throated sparrow and ovenbird establishes its own personal nesting property, then defends it by singing and flying back and forth whenever a stranger approaches. The Australian magpies defend their territory in groups, not individually.

As the breeding season continues, each bird or group of birds learns to recognize and accept its neighbor and does not become so excited when the neighbor approaches the boundary line.

In order to discover exactly by what feature of song the birds recognize one another, the scientists took recordings of the neighboring birds' songs, and then altered them in time, pitch, pitch pattern and number of notes. They discovered that a change of pitch evoked a strong singing-warning behavior, indicating that the birds no longer recognized the songs as those of their neighbors.

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BOTANY

Plants 'Fingerprinted' For Identification

➤ SCIENTISTS are "fingerprinting" plants for identification purposes.

The new recognition technique uses two-dimensional paper chromatography to take prints or patterns of extracts from a particular plant, Dr. Bert G. Brehm, Reed College, Portland, Ore., reported. Just as human beings each have a different pattern of lines on their fingertips, so plant species have individual patterns. No other plant species will have the same pattern, Dr. Brehm told scientists in Urbana, Ill., at the annual meeting of biological societies, sponsored by the American Institute of Biological Sciences.

The pattern technique has been used to identify other chemical compounds such as proteins.

The nature of the pattern or fingerprint can also help identify the genetic relationships of two different plant species

When two species are mated, or hybridized, their offspring has a pattern or print that tends to be the combined pattern of both parents.

Thus scientists may be able to trace the ancestors of a plant whose ancestors are unknown.

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