

BIOLOGY

Scientists Use Organisms To Wipe Out Insect Pests

THE GROWING resistance of disease-bearing insects to many of the chemical insecticides is prompting greater use of biological insect control.

Biological, or natural, control is checking insect growth by use of such natural parasites or predators as viruses, bacteria, fungi, nematodes (worms), protozoa, or other larger organisms.

Natural control has had a limited use for some time. The Japanese beetle, for example, is now largely controlled by a white spore dusted on lawns, which causes milky spore disease in the beetles and results in their death.

The introduction of effective chemical insecticides, such as DDT, in the control of insects resulted in a general abandonment of interest in natural control. Increased insect resistance to insecticides, however, and the fact that large-scale use of some insecticides has also killed off many organisms that normally feed on insect pests, have renewed scientific interest in natural control as a supplemental means of insect eradication or as a replacement for chemical means.

To review previous work in the field and to determine future research, an international group of scientists is meeting at Walter Reed Army Medical Center in Washington, D. C., to discuss "biological control of insects of medical importance."

Dr. Dale W. Jenkins of the U. S. Army Biological Warfare Laboratories, Fort Detrick, Frederick, Md., listed medically important insects and the most promising organisms of natural control. The insects included the mosquito, housefly, horsefly, blackfly, stablefly, tsetse fly, flea, louse, cockroach and tick.

Science News Letter, February 13, 1960

AGRICULTURE

Seaweed Meal Improves Tobacco Plant Quality

AROMATIC TOBACCO plants with improved leaf quality and higher sugar content have been raised in soil enriched with seaweed meal, it was reported.

The kelp-fed plants showed a significantly lower respiratory activity than plants not given kelp. A low respiratory rate implies less breakdown, and hence greater conservation, of sugar, which results in a better quality leaf.

In experiments at Clemson College, Clemson, S. C., under the direction of Dr. T. L. Senn, Norwegian kelp meal, *Ascophyllum nodosum*, was mixed with soil in aromatic tobacco plant beds at rates of 100, 200, 300, 400 and 500 pounds per acre.

Plants from the various lots, plus those from a control lot receiving no seaweed, were transplanted to the field and three successive leaf samples were taken. During early vegetative growth, the plants from beds having received 300, 400 or 500 pounds

of kelp per acre had a significantly lower respiratory activity.

At the second sampling, a month later, the kelp-fed plants showed a lowered respiratory activity with greater influences being exerted at the higher rates. At the final sampling, late in the growing season, only the plants from the two higher rates showed significant reduction in respiratory activity.

There is evidence, Dr. Senn said, that seaweed in some way produces or stimulates plant hormones that act as regulators of plant growth and development. This was shown, he said, by altered enzymatic activity within the plant parts.

Assisting Dr. Senn were J. A. Martin, J. H. Crawford and B. J. Skelton, all of Clemson. Their findings were reported to the annual meeting of the Association of Southern Agricultural Workers in Birmingham, Ala.

Four treatments testing the effect of seaweed on pimento peppers were also reported by Dr. Senn. In one, no kelp was administered, in another, kelp was mixed into the soil at the rate of 200 pounds per acre, a third used a spray consisting of three teaspoons of kelp extract per gallon of water, and another combined the spray with the soil mixture.

The number of pods per plant increased to 2.7 in the plants that had been treated with kelp in one way or another, while the control plants had an average 1.5 pods per plant. Also, there was an increase in plant height from 10.6 inches in the control plants to 18.1 inches in the kelp-fed plants.

Science News Letter, February 13, 1960

ZOOLOGY

Australia Bans Export of Animals and Birds

KOALAS, platypuses and lyre birds can no longer be freely exported from Australia.

The Australian Government has also banned the export for commercial purposes of all other birds and animals native to Australia. Skeletons, skins and plumage of koala bears, platypuses and lyre birds can be exported only for scientific purposes. Exports for zoological purposes will be permitted only on a zoo-to-zoo basis and on the distinct understanding that no commercial trading will be involved.

The minister for customs, Senator N. H. D. Henty, said the export of Australian fauna in recent years had reached "considerable proportions."

Sir Edward Hallstrom, the former chairman of the Taronga Park Trust, said the ban on the commercial export of all Australian fauna was long overdue. Sir Edward, who presented the San Francisco Zoo with three koalas in 1959, said he had not intended to send any more koalas outside of Australia.

He had received hundreds of requests for Australian animals from all parts of the world.

Science News Letter, February 13, 1960

IN SCIENCE

MEDICINE

Muscular Dystrophy Slowed Down in Mice

MUSCULAR dystrophy in mice has been slowed down with a drug that is similar chemically to the male sex hormone testosterone, reports Dr. Robert M. Dowben of the Northwestern University Medical School. The drug, 17-alpha-ethyl-19-nortestosterone, also more than doubled the survival time of mice that had a hereditary disease closely resembling human muscular dystrophy. Clinical tests showed serious side effects in humans, however, Dr. Dowben reports. The drug increases synthesis of creatine, a substance needed for proper muscle function. Details of the research appear in *Nature* (184, 1966, Dec. 19, 1959), delayed in distribution in the U.S. due to a printers' strike.

Science News Letter, February 13, 1960

PEDIATRICS

Nation's Diaper Industry Forms Baby Care Council

A COURSE in baby sitting may soon be on the school curriculum, Dr. Ernest G. Osborne, chairman of the newly formed National Baby Care Council, said.

The course, designed to combat the growing problem of unskilled baby sitters and to safeguard infants, will be given with the cooperation of the nation's schools, parent-teacher associations and community service organizations, Dr. Osborne said. He is with the department of home and family life at Columbia University's Teachers College.

The council is preparing a film strip on baby sitting, a booklet for the young baby sitter to keep for study and reference, and an instruction manual to aid teachers and youth leaders in presenting the baby sitter program.

The baby sitter program is one of two immediate projects currently being sponsored by the National Baby Care Council. The other is a booklet on preventing diaper rash.

Entitled "Mother's Guide to Diaper Hygiene," the booklet is part of a nation-wide campaign to eliminate diaper rash, a skin ailment few infants escape. The booklet will be based on scientific and medical information and distributed to mothers through their physicians.

The diaper service industry is supporting the baby care council. Composed of representatives from medical, public health, education, nursing, social service and community organization fields, the council has as its aim to focus attention on the development and welfare of the baby from birth to about two years of age.

Science News Letter, February 13, 1960

CE FIELDS

BIOLOGY

Antimicrobial Compound Obtained From Sponge

THE "RED-BEARD" sponge, commonly found along the Atlantic coast of North America, apparently contains a potent antimicrobial agent.

The sponge extracts—the best one was obtained with ethyl ether from living sponge cell suspensions—are effective against microbes in the test tube. They also seem to be effective in the living animals, a team of researchers from the New York Aquarium report.

The extract, named Ectyonin by its discoverers, Ross F. Nigrelli, Sophie Jakowska and Idelisa Calventi, is "remarkable for its activity against a variety of microorganisms," they said. Growth of cultures of Gram-negative, Gram-positive and acid-fast forms was inhibited.

Of special interest is the extract's activity against *Pseudomonas pyocyanea*, the organism responsible for "blue pus."

In live animal tests of the extract, fish injected with both bacteria and a sesame oil suspension of the extract survived. Fish injected with bacteria alone died in a "relatively short time." Further tests, however, are needed to evaluate the live animal tests. The extract does not seem to be toxic to fish or mice. The studies are reported in *Zoologica* (44, 173, Dec. 31, 1959), published by the New York Zoological Society.

Microciona prolifera is the sponge's scientific name.

Science News Letter, February 13, 1960

ROCKETS AND MISSILES

Meteors Little Threat To Short Space Trips

METEORS, often seen on earth as "shooting stars" in the night sky, appear to pose little or no threat to the safety of a rocket ship or its crew on short trips.

Data obtained so far from the U. S. Explorer VII satellite, which has been up since Oct. 13, 1959, showed, at the end of the year, only one "hit" by a tiny particle on a special cell designed to check meteor impacts. This "hit," however, occurred in the launch phases of the rocket and scientists believe dust from the rocket itself, rather than a tiny meteor, caused the instrument to report a "hit."

Dr. Homer E. Newell of the National Aeronautics and Space Administration said information from Explorer VII so far indicates that micrometeors do not pose an engineering problem for short trips. Their threat on a two- or three-year trip, however, is unknown. Explorer VII is slated to stay up for about 20 years, but will transmit data back for only about a year from launch.

About 300 miles of taped telemetered signals were received from the satellite during 1959. Scientists reported that:

1. On two occasions, bursts of high intensity radiation were observed near the inner edge of the radiation belt that is fairly close to the earth.

2. A temporary rise in radiation was measured over North America on Oct. 18, 1959. It appeared to be tied in with a magnetic storm on earth that occurred between Oct. 16 and 20.

3. Greater swings in cosmic ray intensity were recorded at the satellite's 300- to 600-mile altitudes than on earth.

4. The satellite has spotted big storms, measuring 1,000 miles across, on the earth's sunlit side. Evidence indicates better instruments in the future will detect such storms on the earth's dark side. Explorer VII instruments are too crude to enable weathermen to predict weather from satellite readings yet.

5. Temperatures in space are easily handled. One transmitter has operated at temperatures between 60 and 64 degrees Fahrenheit. Skin temperatures, so far, have varied from a maximum of 128 degrees to about freezing.

Science News Letter, February 13, 1960

METALLURGY

New Method Speeds Metal Failure Prediction

A FAST WAY has been found to predict if a steel casting will develop tiny fractures inside that later might result in a steam turbine's blowing up in operation.

Developed by Dr. F. C. Hull, metallurgist at the Westinghouse research laboratories, Pittsburgh, Pa., the method reduces to minutes a check-out procedure that once ran into weeks and months and cost up to thousands of dollars in time and materials.

The new method checks "hot cracking" in small metal samples. Hot cracking sometimes occurs when steel and other metal alloys are subjected to the heat and stress of welding, or when a molten casting solidifies.

In contrast to the previous method, when a test slab sample weighing about 100 pounds was needed, the new method requires only a one-ounce metal sample. This small sample is melted by electromagnetic induction while held suspended in mid-air by a magnetic field.

In ten or 15 seconds, the white-hot molten metal is poured into the mold for a slightly tapered pin. The top and bottom of the pin lock into place to prevent normal contraction of the metal as it solidifies. The longer and slimmer the pin, the greater the tearing forces that are built up.

By comparing pins of different lengths and diameters, a scale is built up to describe the metal's susceptibility to hot cracking.

Dr. Hull has found that the tearing of a metal casting as it cools, and shrinks from a liquid into a solid, is comparable to the cracking of a weld as it freezes. Thus by studying the quickly cast metal samples, a laborious process of welding 100-pound test samples and checking for defects with a microscope is avoided.

Science News Letter, February 13, 1960

AGRICULTURE

Meat Tenderness Tested Before Animal Is Killed

IF YOUR STEAK has a pressure reading greater than 300 pounds per square inch, you had better get out a sharp knife. It is quite a tough cut.

A new hydraulic press, developed by the U.S. Department of Agriculture, can test raw meat right out of the slaughterhouse. It can also be used to test the tenderness of tiny samples of beef taken from the living animal. This means that meat packers, butchers and housewives can know how tender meat is before it is purchased.

Geneticists will also profit by the new device since they can use it as a guide in breeding animals with tender beef.

Readings on the tenderness tester, which takes cooked as well as raw meat, compare favorably with taste panel evaluations and with a device that measures cooked meat's tenderness. A reading up to 200 pounds per square inch means a tender cut; 200 to 300 psi, moderately tender; more than 300 psi, quite tough.

With the press, it should be possible to give a side of beef a rank in a "carcass tenderness index," said USDA meat technologists, Doris Sperring, W. T. Platt and R. L. Hiner. Meat tenderizers could also be better evaluated by checking tenderness before and after use.

Science News Letter, February 13, 1960

CHEMISTRY

Discovery Adds Clues to Composition of Lignin

THE SUGAR GLUCOSE is part of the answer to a biochemical riddle—the exact composition of lignin.

Lignin, which together with cellulose comprises wood, is a highly complex carbohydrate whose complete structure is unknown. It is considered a waste product even though most vanillin in this country is now made from it.

Some 20,000,000 tons of lignin are thrown away by the pulpwood industry each year.

Experiments at Fordham University under the direction of Dr. Friedrich F. Nord have shown that in Norway spruce trees the lignin is derived from glucose.

The discovery was made by feeding the trees with solutions containing radioactive glucose. The lignin formed by the trees was then isolated and found to contain the radioactivity originally present in the glucose.

By studying where the radioactivity was located in the lignin the scientists were able to find how the glucose molecules were converted into these units.

The significance of the discovery lies in the fact that scientists are now closer to determining the true composition of lignin. Thus, they may some day be able to find as many uses for lignin as they have for cellulose.

Assisting Dr. Nord were Dr. Walter J. Schubert and Samuel N. Acerbo.

Science News Letter, February 13, 1960