ENTOMOLOGY

Weapons Against Insects

A variety of methods including black light and sterility drugs for eliminating insects and other animal pests without endangering humanity are being devised.

➤ MAN'S WAR against the insects and larger wild beasts is about to use new weapons that will not cause a backlash against his health and safety.

Black light infrared radiation will be sprayed about to immobilize or kill the pestiferous insects before they can damage crops or spread disease.

Powerful odor to lure male insects and make them think that females await them will be spread about mixed with insecticide as death traps.

More plants will be bred to be unattractive to insects and thus resist their damage.

Chemical molecules will be created to penetrate invading fungus cells and not the useful plant they attack.

Birth control will be forced upon undesirable wild animals by spreading in their food the kind of chemicals that will make them sterile, a process that will be more acceptable than killing excess populations.

Dr. Philip S. Callahan, U.S. Department of Agriculture research entomologist, Tifton, Ga., reported the discovery that antennae of moths can detect infrared radiation invisible to human eyes and that this dark light can be used to both kill and attract this insect. Moths use the black light to communicate and to locate plants upon which to feed.

The American Association for the Advancement of Science meeting in Montreal also was told by Dr. Morton Beroza of the U.S. Department of Agriculture's Agricultural Research Service, Beltsville, Md., that chemical counterfeiting of the sex attractants of insects allows a pinpointing of the insecticides to kill them, preventing spreading poisons needlessly.

This has proved effective against the gypsy moth and the latest quirk in this kind of attack is to release the synthetic sex attractant over a large area, utterly confusing the male moths in their attempts to find the females. The dangerous oriental fruit fly was eradicated from an isolated Pacific island by this method at a cost of only 50 cents an acre.

Instead of just poisoning insects, more crops will be made insect resistant by breeding, Dr. Reginald H. Painter of Kansas State University, told the scientists. Resistant plant varieties are cumulative and long lasting in their effect on reducing insect populations, he explained. Resistant varieties produce continuous control in contrast to often cyclic control by parasites, predators and insecticides.

Fungi that take a large crop toll are being foiled by an array of organic molecules that act in a variety of ways, Dr. George L. McNew of the Boyce Thompson Institute for Plant Research, Yonkers, N.Y., reported. Fungicides act by destroying enzymes in the host that are needed by the fungus and Dr. McNew foresees that similar methods of attack will give better compounds for plant protection.

The control of wild animals in the future by use of sterility-promoting drugs fed them in food that they scavenge was the suggestion of Dr. David K. Wetherbee of the University of Massachusetts, Amherst. It is better than shooting them down, he said.

• Science News Letter, 87:37 January 16, 1965

GENETICS

Life Activity Observed

➤ FIRST THERE IS a "puff" or swelling of a gene that sets off a "puff" on another gene—and thus begins the basic chain of activity that controls a living cell, a biologist reported to the annual meeting of the American Association for the Advancement of Science in Montreal.

The mystery of life came closer to being understood when Dr. Ulrich Clever of Purdue University, Lafayette, Ind., discovered the mechanics of the first steps of chemical activity that control the life of a cell, and hence life itself.

By observing giant chromosomes of a mosquito-like insect under a microscope, Dr. Clever has been able to watch individual genes in action and see how they set off and control other cell processes. The action of one gene sets off the action in another in a continuing sequence, Dr. Clever said.

Genes are tiny chemical units in a living germ cell of an animal or plant that transmit an inherited characteristic from one generation to the next. Genes are located on bands or stripes of long tube-shaped chromosomes in germ cells that result from the union of sperm and ovum from the parents. The presence and placement of genes on the chromosomes determine exactly what the offspring will become.

Until recently the mechanics of how genes function could not be observed, chiefly because they are so small they cannot be seen under a microscope.

The mosquito-like insect, *Chironomus tetans,* has certain cells with oversized chromosomes that are 10,000 times thicker and 10 times longer than ordinary chromosomes of other insects or living things.

By observing these genes and chromosomes, Dr. Clever noticed the first puffing or activity on two specific genes that initiated the molting process of the insect, when it sheds its skin or shell. A specific ribonucleic acid (RNA) was manufactured from these genes, which sent instructions for making proteins or enzymes that activated later-acting genes in the molting process.

When the actions of these genes were delayed, Dr. Clever discovered that other molting processes in the insect's life cycle were delayed.

• Science News Letter, 87:37 January 16, 1965

Goodyear

WORM SPRAYER—Bollworms and other cotton pests are sprayed with this weird invention of an Altus, Okla., farmer. The wide tires, produced by Goodyear, prevent it from sinking in soft ground.

ZOOLOGY

Dr. Alfred S. Romer Is AAAS President for 1965

➤ PROF. ALFRED S. ROMER of Harvard, authority on the 500-million-year-long story of the vertebrate animals on earth, was elected the new President of the American Association for the Advancement of Science, and assumed office on Jan. 15. Dr. Romer is Alexander Agassiz professor of zoology at Harvard.

Prof. Romer's research has centered on the amphibians and reptiles that flourished during the Permian period, some 200-225 million years ago, and especially on the pelycosaurs, which cast light on the remote origin of mammals. He has collected rare fossils in South Africa and Argentina, but mainly in Texas, where he has dug around in the Permian red-beds for more than 30 summers. From 1946-61, as director of Harvard's Museum of Comparative Zoology, he headed one of the largest research museums in the world and is still curator of vertebrate paleontology of the museum.

• Science News Letter, 87:37 January 16, 1965