ENTOMOLOGY

Beetle Splatters Blood To Fight Enemies

➤ A TINY BEETLE routs his enemies by splashing them with his own sticky blood.

The Mexican bean beetle, *Epilachna varivestis* Mulsant, bleeds at the leg joints whenever he is attacked by his enemies such as ants. The blood, forming as tiny droplets, spreads over the ant and leaves him squirming in a molasses-like substance.

During laboratory tests, Mexican bean beetles artificially prodded bled only at the leg joints closest to the source of irritation, Drs. George M. Happ and Thomas Eisner, Cornell University entomologists, report in Science, 134:329, 1961. When the stimulus was repeatedly applied to the same site, the bleeding spread to the other legs.

"The amount of blood that the beetles can stand losing is considerable," the scientists note. "No noticeable ill effects result from a loss of six droplets," which is a lot of blood for a tiny beetle.

Attacking ants doused with the beetle's blood would immediately back away and begin washing themselves intensely. The ants eventually recover although it may take from several minutes to more than an hour to clean themselves thoroughly, the scientists state.

• Science News Letter, 80:120 August 19, 1961

MEDICINE

Lung Cancer Study Shows Cigarettes Major Cause

➤ "ALREADY OVERWHELMING EVIDENCE" that cigarette smoking is a major factor in the cause of lung cancer has been "greatly" strengthened by a new study reported in The New England Journal of Medicine, 265:253, 1961.

More than 83,000 punch cards were used to record data on autopsied sections of tissue taken from the air passages (tracheo bronchial tree) of 402 men who died of various causes in several eastern hospitals.

Of 63 who had died of lung cancer, 55 had regularly smoked cigarettes up to the time of diagnosis, five smoked cigarettes regularly but had stopped before diagnosis, one had smoked both pipe and cigars regularly and one smoked cigars regularly.

The remaining 339 men who died of other causes, including several types of cancer, had not worked in occupations for which extremely high rates of lung cancer had been reported. However, some of them had been exposed to air pollutants in such jobs as painting and automobile mechanics' work.

Fifty-five of the men had never smoked regularly, but 143 had smoked from one to two packages of cigarettes a day, 36 smoked two or more packages a day, and the others smoked up to one-half a package a day.

Abnormal cells were found in the bronchial tissues examined among all smokers, whether or not they died of lung cancer.

In this study Drs. Oscar Auerbach and A. P. Stout of the East Orange Veterans Administration Hospital, N. J., with Dr. E. Cuyler Hammond and Lawrence Garfinkel of the American Cancer Society, New York, found one or more of certain types of tissue changes more frequently among those who had smoked. The changes included destruction of cilia or of the entire hair-fringed cells, an abnormal number of normal cells (hyperplasia) and abnormal cells, all of which greatly increased in proportion to the amount of cigarette smoking.

• Science News Letter, 80:120 August 19, 1961

MEDICINE

Ancient Egyptians Had Today's Diseases

➤ THE PEOPLE of ancient Egypt were subject to most of the same afflictions that plague mankind today, ranging from bedsores to hydrocephalus, Dr. J. T. Rowling reported to the Royal Society of Medicine in London. New techniques of X-ray examination have made possible the discovery of hitherto undetectable information.

The Pharaoh Siptah suffered from "club foot," while Rameses V appears to have had smallpox. Many other afflictions have been detected in mummies, including pneumonia, appendicitis, gallstones and tuberculosis.

Two ailments not found were syphilis and a particular deformity of the big toe probably lacking because of a characteristic of the Egyptian sandal.

• Science News Letter, 80:120 August 19, 1961

MEDICINE

Heart Ailment Caused By Experimental Drug

➤ AN EXPERIMENTAL DRUG used to treat advanced cancer in nine patients caused unexpected heart disease in three.

The reaction of these patients with far-advanced cancer to the drug, tried only after all other treatment had been exhausted, was a "surprise" to the two doctors administering Psicofuranine. They warn that heart disease caused by other experimental drugs could be a "serious problem."

From taking Psicofuranine, both orally and by injection, three patients developed inflammation of the sac surrounding the heart, Drs. Robert C. Yates and Kenneth B. Olson of Albany Medical Center, Albany, N. Y., report in The New England Journal of Medicine, 265:275, 1961. The reaction stopped four or five days after the drug was withdrawn and was not believed to have made the patients any worse.

Psicofuranine is an antibiotic, known chemically as 6-amino-9-D-psicofuranosylpurine. It is successful in the laboratory as an antitumor drug, among other uses.

"It seems doubtful if this drug will have any place in therapeutic medicine," the physicians state, "but with the host of antibiotics and antitumor agents being tested and developed, drug-induced pericarditis may be seen again and may be a serious problem."

• Science News Letter, 80:120 August 19, 1961

IN SCIENC

MEDICINE

Theory of Insulin Control of Diabetes

➤ A CONTROVERSIAL theory of how insulin controls diabetes was described by a University of Maryland professor at the Fifth International Congress on Biochemistry in Moscow.

How insulin actually works in the body has never been clarified despite successful isolation of the hormone from pancreatic tissue for control of diabetes some 40 years ago, Dr. Samuel P. Bessman of the University's School of Medicine, Baltimore, said. The body hormone, which is necessary to prevent diabetes, affects the absorption of sugar but equally affects the production of starches and fats.

Dr. Bessman discussed the relationship of his own findings to the broader problems of protein synthesis and the release of cellular energy in the body. He believes that insulin may act as a "metabolic clutch" in releasing energy within living cells.

His theory is that insulin binds tryptophan, a protein building block, to muscle protein. It acts, he believes, to connect mitochondria to the enzyme in the cell. By making the mitochondria more efficient, the insulin gives all cells a boost.

Mitochondria are little particles in the cell that generate energy in usable form as metabolic fuel. They are a mobile power unit, but they have to be near to what they give power. A special enzyme in the cell is needed to get the particles operating.

This enzyme is usually free in the cell, and it is Dr. Bessman's theory that insulin connects this enzyme to the mitochondria.

• Science News Letter, 80:120 August 19, 1961

AGRICULTURE

West African Swamps Useful in Rice Production

➤ RICE PRODUCTION in West Africa can be increased by millions of acres to supply a much needed source of food.

N. Parthasarathy, a rice expert of the Food and Agriculture Organization of the United Nations (FAO) in Rome, found that development of vast areas of swamp mangroves along the West African seacoast and in the deltas further inland would provide productive land for extensive rice cultivation. However, problems to be overcome include the reluctance of farmers to settle in these areas, the need for large scale mechanization, and the lack of storage and marketing facilities once the rice is harvested.

Experimental stations have been established by FAO for research into rice production in Senegal, Sierra Leone, Nigeria, Ghana, the Ivory Coast and other areas of West Africa.

• Science News Letter, 80:120 August 19, 1961

E FIELDS

ENGINEERING

Coding Chopped Chatter Boosts Phone Traffic

➤ TELEPHONE users who call nearby Passaic, N. J., from Newark are having their voices "sliced" and translated into a mathematical code of high-speed electronic pulses.

The experimental Bell Telephone Company system sends 1,500,000 pulses over the wires per second, increasing the message capacity greatly.

Samples of a user's voice are taken about 8,000 times a second, coded as pulses, and rebuilt at the Passaic end of the line, sounding just as usual to the party being called.

The technique is called PCM, for "pulse code modulation." The Newark-Passaic routing is called the T-1 system.

Because high-frequency pulses tend to "decay" en route, booster amplifiers are located every 6,000 feet along the line to rebuild the coded signals and send them on to the next relay point.

T-1 was designed to serve metropolitan area lines up to 25 miles. Since existing cable can be used in making the change-over, it is expected to be a boon to large cities where room for more underground cables is scarce..

T-1 was developed by Bell Telephone Laboratories at Murray Hill, N. J., and Merrimack Valley, Mass.

• Science News Letter, 80:121 August 19, 1961

MEDICINE

Lymphocyte May Prevent Successful Skin Grafts

A PARTICULAR TYPE of white blood cell known as the small lymphocyte may prevent the successful grafting of skin, kidneys or other tissue from one individual to another.

This kind of white blood cell has been identified as the culprit in causing a breakdown of tissues transplanted between individuals other than identical twins.

The fact that white blood cells are implicated in the body's rejection of tissue not recognized as its own has been generally accepted. But which one of the several types of white cells played the leading role was not known. In fact, the function of the small lymphocyte has been a mystery.

In research at the University of California, Los Angeles, Medical School, Drs. William H. Hildemann, William D. Linscott and Mrs. Margaret Morlino injected purified small lymphocytes from adult mice of one strain into newborn mice of another strain. The white cells of the newborn had not yet developed the ability to distinguish foreign cells from their own. Thus they did not react against the injected cells. However, the white cells from the adult mice attacked the tissues of the newborn and caused the animals to die within a few weeks.

It is now evident that the mature small lymphocyte is by itself competent to cause the homograft reaction, that is, to destroy tissue from another individual it recognizes as foreign.

Dr. Hildemann said that only from a more detailed knowledge of the cells and mechanisms involved in the homograft reaction in all its forms will it be possible to approach the goal of making tissue homografts acceptable to adult humans who would otherwise react against them.

• Science News Letter, 80:121 August 19, 1961

AGRICULTURE

Cows Give More Milk When Pastures Improved

➤ INCREASING GRASS production in pasturelands increases milk production.

Showing dairy farmers in Brazil's Rio Grande do Sul how to increase grass production was one of the major aims of Ejnar Faber, a Danish dairy production expert of the Food and Agriculture Organization of the United Nations (FAO), who spent three years in the Pelotas area in conjunction with a UNICEF project to supply milk to undernourished children in the northeast region of Brazil.

Range production was increased to about five times by introducing forage plants, including grass seeds (tall fescue) from the United States. Cattle in the State of Rio Grande usually have enough grass for only six months of the year and survive on a semi-starvation diet for the rest of the year. With a constant supply of food, milk production was increased from about 100 gallons per year per cow to about 450 gallons.

The program also included a study of milk hygiene, herd sanitary problems and disease control in animals.

• Science News Letter, 80:121 August 19, 1961

ORNITHOLOGY

House Wrens Choose Red or Green Boxes

➤ BIRD LOVERS who want to attract house wrens to their yards should paint the nesting boxes red or green.

This advice results from an 11-year study by Dr. Robert A. McCabe of the University of Wisconsin in which he built red, yellow, blue, white, and green nesting boxes for house wrens. Using the out-of-doors for a laboratory, he constructed 98 nests of these colors, then rotated their positions in order to determine the basis of choice on color alone.

House wrens were lured most to the red or green boxes. White was the least popular hue. Most scientists believe that birds can differentiate between various colors, although the range of colors they can tell is limited.

Knowledge of the color awareness of birds is valuable from an evolutionary standpoint, and is also useful for pest control devices, Dr. McCabe reports in The Condor, 63:322, 1961.

• Science News Letter, 80:121 August 19, 1961

PUBLIC HEALTH

Smoker's Cough Often Lung Cancer Warning

➤ DO NOT IGNORE a smoker's cough. It is a warning that could save a life, an expert advises.

The smoker's cough serves a purpose in sending some affected persons to their doctors for early treatment that may prevent serious illness such as lung cancer.

Studies by a statistical research expert of the American Cancer Society, Dr. E. Cuyler Hammond, show that giving up the smoking habit may also prevent other smoking-caused illnesses from becoming serious.

The death rate from coronary artery disease, peptic ulcers, as well as lung cancer and other diseases associated with smoking habits can be reduced through early diagnosis and treatment, Dr. Hammond states.

A survey of smoking habits of 18,697 men and 24,371 women over the age of 30 showed "many different complaints" caused by smoking, he reports in the Archives of Environmental Health, Aug., 1961.

Smoking produces coughing, shortness of breath, loss of appetite and certain other complaints in susceptible individuals, Dr. Hammond found. These complaints sometimes have the effect of "inducing individuals to smoke less, inhale less, switch to low-nicotine cigarettes or give up smoking."

• Science News Letter, 80:121 August 19, 1961

METEOROLOGY

Huge Breaks in Ice Modify Antarctic Storms

➤ THE FIERCE STORMS that frequently lash the Antarctic continent are strongly influenced by broad expanses of open water along its coast.

Much of the energy of winter storms is tapped from the heat energy rising from these huge ice "holes," Russian scientist Dr. V. N. Kupetskiy of the State Oceanographic Institute, Leningrad, reports in a translation by the U. S. Joint Publications Research Service. These ice holes remain open for days or even months during the cold winter.

Nearly all tracks of winter storms studied ended abruptly in the regions of open water, the Russian scientist found. These swaths of open water, which frequently reach lengths of many hundred miles and a width of ten miles, exert a strong influence on the atmosphere's circulation.

Previously many scientists either ignored the effect of these openings or thought their significance was relatively minor, the scientist states. The open waters lose about 20 times more heat to the atmosphere than does the surrounding ice. This high amount of heat transfer is clearly seen by the low-lying clouds and fog frequently hanging over the area.

The Antarctic's winter storms occur during the Northern Hemisphere's summer months, since tilting of the earth on its axis creates opposite seasons in the two hemispheres.

• Science News Letter, 80:121 August 19, 1961