

PHYSIOLOGY

Giant Octopus Study Related to Blood Pressure

A BETTER understanding of high blood pressure, allergies and mental health is expected to result from a study of the Pacific giant octopus.

The venomous substance secreted by the salivary glands of the octopus, which has a stunning effect on its prey, is rich in hormone-like substances that are an important part of the intricate biochemistry of the human nervous system.

These include serotonin, a little understood but apparently important hormone or nervous system regulator; histamine, which dilates blood vessels, regulates gastric juices and is involved in inflammations and allergies; and two adrenaline-like hormones, tyramine and octopamine.

Quick-frozen octopus salivary glands are flown to Los Angeles from Puget Sound. The creatures, as large as 100 pounds, are caught alive for the Japanese food market. In the laboratory the glands are processed and the hormone-like substances are extracted for study.

Drs. William G. Clark and William J. Hartman of the University of California Medical School, Los Angeles, and the Veterans Administration Center, Los Angeles, are conducting the study which is being supported by the National Science Foundation and the American Cancer Society.

"If we can learn more of the normal chemistry that gives rise to these nervous system regulators, we will have a better understanding and possibly control of the abnormal chemistry involved in high blood pressure, various mental disorders, inflammation and allergies," the investigators said.

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PUBLIC HEALTH

Polio Hits Unvaccinated Boy Block From Clinic

PARALYTIC POLIO struck a 17-year-old boy who has never received a Salk shot although he lives one block from a clinic where the vaccine is given free.

He is now hospitalized, both legs paralyzed. This boy is one of more than 1,560 persons paralyzed this year by the polio virus. This is more than twice the 579 cases reported to the U. S. Public Health Service at this time last year.

As the number of cases continues to climb, presently there are more than 2,480 reported cases of all types of polio, more people are getting out for their Salk shots. This has resulted in a drain on the supply of available vaccine because many private, local and state clinics are open more hours to give the vaccine, and because many new clinics have been established for the emergency period.

Despite this seemingly pessimistic news, public health officials expect the drug industry to be able to up their supply of the vaccine and relieve the situation. More than 2,000,000 doses have been delivered to doctors, clinics and other centers for vaccination each week for the past several

weeks. Officials expect this amount to increase shortly.

Polio severely hit Des Moines, Iowa, New Haven, Conn., Kansas City, Mo., the states of Texas, California, Alabama and Pennsylvania, statistics from the PHS reveal. Alaska has reported six cases so far.

Last year, 322 cases of paralytic polio were reported in persons who had had the three Salk shots. Dr. C. C. Dauer, medical adviser for the National Office of Vital Statistics, explained that although a person has had three shots, if he is severely paralyzed, this usually eliminates other viruses as a cause of the paralysis. He probably has polio. Salk shots offer between 70% and 90% protection against paralytic polio.

Then, too, there are a number of diseases caused by viruses which have been implicated as a cause of a muscular paralysis that resembles crippling polio, Dr. Vernon Knight of the National Institute of Allergy and Infectious Diseases, Bethesda, Md., told SCIENCE SERVICE.

If a victim of paralysis is examined after the culprit virus has left his body, doctors can many times determine if the disease is polio by measuring the level of the patient's polio antibodies, he explained. If these antibodies are extremely low, then some other virus becomes suspect.

Most of the polio cases reported through the PHS are carefully screened to establish the presence of one of the three polio viruses as the cause of the paralysis.

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BIOLOGY

Biologist Predicts Lawns That Need No Mowing

TEN YEARS FROM NOW you will be able to sit on a lawn that needs no mowing and reach up to pick a normal-sized peach from the low branches of a dwarf tree.

This will be possible because within 10 years we will have an "anti-gibberellin," Dr. James A. Lockhart, biologist at the California Institute of Technology has predicted.

Gibberellin, the hormone that plants secrete to induce stem growth, has been widely studied, Dr. Lockhart pointed out. Considerable research is under way to discover an anti-gibberellin which would suppress the growth of plants without affecting their ability to flourish and yield normal crops.

An application of this anti-gibberellin, perhaps in a spray form or as an additive to fertilizer, could slow plant growth so that grass, for example, would need virtually no trimming. Fruit trees treated with the anti-growth substance would be the same as normal trees except for their shortened stems or trunks. Dr. Lockhart based his prediction of the properties of the anti-gibberellin on what he has learned about gibberellin.

The hormone affects young cells, especially in the plant stem, promoting stem growth by counteracting the effects of sunlight. Light slows down stem growth by making the young cell walls more rigid. Gibberellin enables the cell walls to stretch, growing longer but not wider.

Science News Letter, August 22, 1959

IN SCIENCE

ENTOMOLOGY

Mysterious Fly Poses Threat to Cattle in U. S.

A FOREIGN fly that could be mistaken for the common house fly has been acting differently in its American home. These changes may be a warning of a new pest in the making, a U. S. Department of Agriculture researcher said.

The fly, *Musca autumnalis*, was first reported in Long Island, N. Y., in 1953. Very little is known of its life history or habits. While it is considered mainly a nuisance in its native lands, the fly is proving to be more than a nuisance here, Joseph W. Gentry said.

Potentially, the fly is as menacing to the dairy industry as the Japanese beetle has become to gardeners and farmers. Historically, their invasion of and spread in the United States are not dissimilar.

It has built up to large numbers and is currently "seriously annoying" cattle in Ohio, Indiana, Illinois and New York. Its behavior in the U. S. is largely unpredictable, Mr. Gentry pointed out, since its environment is different. Natural controls, such as parasites that prey on this species of fly, apparently are also missing.

It is too widespread to attempt any eradication program now, the USDA researcher said. At first it was considered as merely a minor garden pest. The beetle increased in numbers, becoming a threat to many crops, until now there are strict quarantine and other control measures in effect.

The USDA's Plant Pest Control Division, survey and detection operations, receives regular reports on insect conditions throughout the nation. State clearing houses send the national office reports on significant "finds," many made by the general public, thereby maintaining a close check on the insect population.

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AGRICULTURE

Short Wheat Promising For Western Farmers

STIFF-STEMMED semidwarf wheat may be the answer for Pacific Northwest growers whose wheat suffers extensively from lodging, or being beaten down by the elements. The semidwarf varieties, Japanese-American blends, resist lodging and stand erect on fertile soil with heavy nitrogen fertilization.

Scientists of the Department of Agriculture and the Washington, Oregon and Idaho Agricultural Experiment Stations are co-operating in developing and testing the grains. Because the milling and baking qualities of the semidwarfs still must be improved, the wheats probably will not be available to growers until 1963 or 1964, the USDA said.

Science News Letter, August 22, 1959

E FIELDS

METEOROLOGY

Seek Way to Measure Changing Height of Smog

A \$10,000 study at the University of California, Los Angeles, supported by the U. S. Weather Bureau and the U. S. Public Health Service, will attempt to find a way of continuously measuring the height of smog.

The results may help meteorologists make earlier and more accurate smog forecasts, said James G. Edinger, assistant professor of meteorology at UCLA.

The height of the polluted air layer is limited by the base of the inversion layer, which serves as an effective lid on the smog layer. With a low inversion base, the pollutants are confined to a shallow layer, resulting in more concentrated smog than when the base is high and the pollutants are dispersed in a deep smog layer.

The height of the inversion base varies from zero to 4,000 feet above the earth surface, depending on the time of the day, the winds, and the seasons.

If an inexpensive method can be found for running a continuous check on the height of the base, air pollution experts should be able to learn more about the causes of inversion, forecast smog conditions more accurately, and give earlier warning for anti-smog emergency actions.

Dr. Edinger will investigate methods such as sending up small measuring instruments called radiosondes, using radar detection techniques, and, at night, following the beams of searchlights.

In other phases of his project, he will measure the vertical distribution of pollutants in the smog layer, and how the atmosphere diffuses pollutants from various complex sources.

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ZOOLOGY

Interbreeding May Affect Mouse Survival Ability

HOW MATE selection influences a species' survival will be tested with mice.

Dr. Howard McCarley, zoology professor at Southeastern State College, Durant, Okla., has received a National Science Foundation grant to carry on a four-year investigation of factors that operate to keep closely-related species of wild animals from interbreeding. The experiment will begin Sept. 1.

He chose wood mice and cotton mice for his experiment, and this summer began assembling the two species while teaching at the University of Oklahoma's Biological Station on Lake Texoma. Construction of pens for the mice has begun at Durant.

"I will start with a group of each kind of mice enclosed in pens that will permit the animals to cross," Dr. McCarley said. "In

this way I will learn whether, if they have a choice, they will mate only with their own kind."

In the second stage of the experiment he will pen up females of one species with males of the other, forcing them to interbreed. This situation will produce hybrids, even though none result from mating by choice in the first stage.

In the third stage, the hybrids, along with equal numbers of unmixed cotton mice and wood mice will be released together in a large pen and given a reduced food supply. Thus Dr. McCarley will learn whether the hybrids are at a disadvantage under competitive conditions.

"The hybrids presumably will not be specially adapted to live either in the low-land habitat of the cotton mice, or in the upland habitat of the wood mice," he commented, "but the experiment will be made under conditions designed to test this hypothesis."

Dr. McCarley formerly worked with the Atomic Energy Commission in an experiment on effects of radiation on these two species of mice.

Science News Letter, August 22, 1959

BIOLOGY

Harmful Beetle Infests Parts of Florida

A MAY BEETLE has arrived in Miami, Fla., and seems to be there to stay.

Once known only in Cuba where it is a sugarcane pest, this is the first record of the beetle in the United States. How serious the insect may be as a pest in the U.S. is not yet known, Kelvin Dorward told SCIENCE SERVICE.

A member of the U.S. Department of Agriculture's plant pest control survey and detection group, Mr. Dorward explained that literature on the May beetle is scarce and it will be some time before all the needed information is in.

Reports from Miami describe the insects as feeding on at least 15 species of native and exotic trees. Damage was "quite severe" on several plants. More than 400 adults were collected in less than one hour by hand picking. However, this does not give a good idea of how widespread the insect infestation may be, Mr. Dorward explained. Even though they appear to be in plentiful supply, their tendency to form clusters makes it difficult to evaluate the seriousness of the May beetle invasion. It is possible to collect many in one local area and then not find any more.

A state survey is now being conducted, and the USDA's detection group is requesting further surveys to learn the extent of the infestation. All inspectors in southern Florida are alerted to look for these beetles and to check for them at lights at night.

Described as a "very ordinary beetle," this species is a small, brown beetle about one-half inch long. Its scientific name is *Phyllophaga bruneri*. Insects in this group are leaf feeders as adults and root feeders as larvae. May beetles, or June beetles as they are also known, are preyed upon by several insect families.

Science News Letter, August 22, 1959

BIOLOGY

Snatching Bats Aids Studies on Drugs

WILD BATS are being caught for use in medical research.

The business of catching bats is a chancy one, J. C. Nicholls says. He brings them back alive from the wilderness around his home in Murphy, N. C.

Many of the bats, *Myotis lucifugus*, are caught from deserted house attics beside a nearby lake, Mr. Nicholls explained.

If there are not enough bats nearby, Mr. Nicholls travels to where they are, sometimes all the way to Florida, 1,000 miles away. He notes that if the bats are in the open, he can catch them rapidly with a large net without harming them. However, if they are back in crevices, it takes a wire to pull them out.

If the bats begin flying about, great skill and quickness are needed to catch them.

"My speed of reaction is 33 hundredths of a second—the average good driver's is about 66 hundredths," he explained.

When bats are caught in mid-flight, their wings are often broken. So these cannot be shipped because they "would perhaps die of shock en route, or be unusable upon receipt," he pointed out.

Bats are used at the Nordson Pharmaceutical Laboratories in Irvington, N. J., to test the effects of drugs on blood flow and vessel constriction. Bats are the only mammals in which vascular changes can be observed visually under close to normal conditions without anesthesia or surgery. This is accomplished by observing their paper-thin wings.

Mr. Nicholls receives two dollars per bat, less "the usual two percent cash discount."

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ENTOMOLOGY

South American 'Hopper Has a "Swimming Time"

ONE SOUTH American insect seems to be having the best of two possible worlds: water and land.

The grasshopper, which has the scientific name *Marellia*, is well-equipped for swimming although it is normally an air-breathing insect. From an evolutionary viewpoint, it is apparently in the process of changing from a land to a water animal, Dr. C. S. Carbonell of the University of Uruguay says.

In a report published by the Smithsonian Institution, he describes how the insect is adapted to its double life.

The most notable adaptation is the grasshopper's "oar-shaped" hind legs. Its eggs are laid underwater where they adhere to the under surfaces of floating leaves. Although the insect lives on the floating leaves of water lilies, it swims easily both on or under the surfaces of ponds and stagnant streams.

Today, specimens of this water grasshopper have been found in Argentina, Uruguay, eastern Peru, British Guiana and Surinam.

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