

## ANIMAL PHYSIOLOGY

**Empty Plate Makes Heart React Same as Full One**

➤ AN EMPTY PLATE will produce the same reaction in a dog's heart as a full plate of food.

Just walking to the food cupboard will sometimes do the same thing.

When a dog is used to a treadmill in the laboratory, just showing him the treadmill switch will produce the same amount of heart effort, temporarily, as working on the treadmill.

These findings, indicating the nervous system appears to be the principal factor in controlling the heart, were reported by Dr. Robert Rushmer of the University of Washington, Seattle, at the American Heart Association meeting in Cincinnati.

Contrary to the general belief that under stress the heart enlarges to increase capacity, dogs' hearts often get smaller while exercising, Dr. Rushmer found.

The findings come from studies made with apparatus consisting of two tiny sonar buttons about the size of an aspirin tablet. They are fastened to the surface of a heart chamber.

One button sends sound impulses 2,500 times a second, the other receives them. Diameter of the heart chamber is measured by travel time of the sound. In addition, a tiny pressure gauge is inserted in the apex of the heart. Fine wires are led from the three instruments to a short terminal an inch or two above the dog's shoulder.

The instruments are affixed by Seattle heart-surgery specialists cooperating in the project. They believe the presence of the tiny instruments has little effect on heart function, and does not interfere with the dog's leading an entirely normal life.

During the studies, the short terminal wires are fastened to laboratory measuring instruments. The dog may be observed at rest, exercising on a treadmill, during excitement, or while eating.

Science News Letter, November 10, 1956

## PUBLIC HEALTH

**Antibiotic Checks Tropical Dysentery**

➤ FOR ANY MAJOR WAR in tropical countries, scientists have a new medical weapon, it appears from a report at the American Society of Tropical Medicine and Hygiene meeting in New Orleans.

The weapon is one of the newer antibiotics, puromycin. It can suppress and prevent infections by several types of intestinal parasites, such as those causing amebic dysentery.

This was found in preliminary trials by Drs. Martin D. Young and Geoffrey M. Jeffery of the National Institute of Allergy and Infectious Diseases, stationed at Columbia, S. C., and Dr. Joe E. Freed of the South Carolina State Hospital at Columbia.

Modern drugs have not been as effective against the protozoan parasites as against bacteria.

Recently, however, puromycin was shown to remove protozoa from the intestines when given as a treatment. The question remained whether it would also be effective as a suppressive medicine.

Patients with various intestinal parasites representing naturally occurring infections participated in the research. In a typical study involving all patients in one ward, 16 of these inmates did not receive puromycin and served as controls, while 37 other patients were given treatment doses of the drug for four days.

Nineteen of these were then put on a six-week suppressive regime, and received half the dose three times each week for six weeks, while 18 were given only the initial treatment dosage.

At the end of six weeks, those receiving the suppressive drug had no protozoa, while those not receiving the suppressive had acquired three infections.

In patients receiving no puromycin, seven of 21 original protozoal infections were lost but 16 new ones were gained, showing that transmission of infection was occurring among those patients, although suppressive doses of the drug protected their associates.

Science News Letter, November 10, 1956

## BACTERIOLOGY

**In-Between Disease Germs Purified**

➤ ONE OF A STRANGE GROUP of disease organisms that have some characteristics like viruses and some like bacteria has been purified by Dr. T. T. Crocker of the University of California Medical Center.

The disease agent causes lung and central nervous system infection in mice, but apparently not in man. Its purification will advance studies of the new group of in-between family disease organisms that infect mice, cats, calves, sheep, parrots and other birds.

Scientists hope studies of these meningo-pneumonitis (P-VL) organisms will eventually provide clues for more effective agents against virus diseases in man.

One advantage to using P-VL organisms for studies lies in the fact that they are susceptible to antibiotics, whereas viruses are not. Accidental infection of laboratory workers, therefore, makes them less dangerous to work with than many viruses.

The P-VL organisms are almost as small as true viruses. They multiply only in a living cell, like viruses, but, when viewed in the electron microscope, they look more like bacteria.

Dr. Crocker cultured the P-VL agent in fertilized chicken eggs. His chief aid in purifying the agent was a detergent, which destroyed cellular material in which the organism grew.

Science News Letter, November 10, 1956

**IN SCIEN**

## MEDICINE

**Anti-Cancer Drug Target Seen in Hormone Activity**

➤ A TARGET for anti-cancer drugs and two potential ones have been found through discovery of an enzyme-binding action of female hormones, reported by Dr. Claude A. Villee of Harvard Medical School, Boston, at the American Cancer Society meeting in New York.

Extremely tiny traces of four forms of the estrogens, or female hormones, activate one of the cell's most vital chemical catalysts, Dr. Villee found. The catalyst, or enzyme, is isocitric dehydrogenase. Activation of the enzyme has the effect of starting the cell's building machinery through which more cells are made.

As the American Cancer Society reports it, "estrogen awakens the sleeping enzyme by binding tightly with it."

If the binding could be prevented, presumably the enzyme would not be active and building of cells, including cancer cells, would not go on. The enzyme-hormone binding thus becomes a target for anti-cancer drugs.

A counterfeit estrogen that strongly inhibits activation of the enzyme and another one that weakly inhibits it have been found, Dr. Villee reported.

Whether these will prove promising enough and non-toxic enough to test against human cancers will not be known until they have been tried in tissues grown in laboratory dishes and in laboratory animals.

Science News Letter, November 10, 1956

## PUBLIC HEALTH

**New Curbs on Food Crop Insecticides**

➤ TIGHTER CONTROLS on the safety of food crops treated with organic phosphate insecticides are announced by the U. S. Food and Drug Administration.

In the future these insecticides, which are related to the nerve gases, will have to be tested for potentiation. This is an increase of toxicity which occurs when some of the compounds are used together.

FDA explains it takes 50 parts per million of EPN in the diet of dogs to produce a noticeable effect and it takes 250 parts per million of malathion to produce a noticeable effect. However, when only 20 parts per million of EPN and 100 parts per million of malathion are fed simultaneously, the combination is quite poisonous to the test animal.

The potentiating action of EPN and malathion for each other was discovered by FDA scientists.

Science News Letter, November 10, 1956

# CE FIELDS

## AGRICULTURE

### Wild Cotton Strain Promises Dirt-Free Crop

► A WILD, LINTLESS STRAIN of cotton now seems to have provided breeders with a needed gene for breeding cotton varieties with such smooth leaves and stems that all trash is easily removed from the lint even though the cotton is machine-picked, as about 25% of today's cotton is.

Dr. J. R. Meyer, geneticist of the U. S. Agricultural Research Service, and scientists at Mississippi Agricultural Experiment Station are cooperating in developing an experimental hybrid variety of cotton that, for all practical purposes, seems to be free of leaf stem and bract hairs.

Crossing and recrossing the wild smooth-leaf variety with an upland commercial hairy-leaf variety, they have bred a new variety that apparently has no undesirable characteristics genetically linked to the new quality of leaf-smoothness.

Rushing the project as much as possible, two generations of hybrid plants are produced each year, one crop being grown in the United States and another during the hot months in Mexico.

Science News Letter, November 10, 1956

## MEDICINE

### Pills for Diabetes Are Still Promising

► THE HOPE that many diabetics can take a pill instead of insulin injections, or "shots," continues even though use of one has been stopped by the company that introduced it into the United States.

Large scale trials of another, similar medicine for diabetics to take by mouth is continuing, SCIENCE SERVICE has learned.

The one that is being continued, because no serious reactions have been reported in its trial so far on over 10,000 patients, is talbutamide, which Upjohn Company of Kalamazoo, Mich., has trade-named Orinase.

The one on which clinical trials have been "suspended" is carbutamide, or BZ-55, introduced by Eli Lilly and Company, Indianapolis, the firm that produced the first commercial insulin preparation for diabetics in January, 1923.

Clinical trials of carbutamide, which have been going on in more than 10,000 patients, have been suspended because of a few serious side reactions in five percent of the patients. These side reactions are described as "identical to those experienced with other sulfa drugs."

Carbutamide and Orinase have both been described in general terms as "sulfa drugs."

Orinase, however, is not really a sulfa drug and should be called a tosylurea. It cannot be measured in body fluids by methods used to measure other sulfa drugs. It differs, also, in that it does not depress the thyroid gland in animals.

Its usefulness is limited to those whose diabetes has started after age 20, and chiefly to those whose diabetes started after age 40.

While trials with Orinase continue, Eli Lilly expects to continue its search for a better drug for diabetics to take by mouth and already has other compounds under study that may offer more promise than the drug it is abandoning.

Discontinuing use of carbutamide involves no danger to the 10,000 patients who have been controlling their diabetes with it. They may safely return to their former method of control.

Science News Letter, November 10, 1956

## FORESTRY

### Douglas Fir Becoming German Timber Tree

► WEST GERMANY is adopting Oregon's Douglas fir as a primary timber tree in its extensive state forests.

"West Germany is in the market for all the Douglas fir seed she can buy," Wolfgang Koehler, forestry attache at the German Embassy, reported after a visit to Oregon's Douglas fir forests.

"Seed is bought and grown by private nurseries, which sell the seedlings to state forests. The biggest German nursery is far bigger than any in the United States."

Germany now imports about 25,000 pounds of fir seed annually. Douglas fir seed at \$12 per pound is so expensive that it is planted sparsely in stands of Scotch spruce and pruned by hand to produce clear lumber.

German lumber production is small in volume, but West Germany devotes as high a percentage of its arable lands to forests as the United States.

Mr. Koehler's primary job is to inspect sources of seed for purchase by German firms to certify quality and type of seed. Seed from various altitudes and localities is being tested in German research projects.

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## GEOPHYSICS

### Undreamed Discoveries Predicted Before 1958

► DISCOVERIES not now dreamed of may result from rocket probings of the earth's atmosphere during the International Geophysical Year, Dr. Joseph Kaplan, chairman of the U. S. National Committee for IGY, predicted in Fort Churchill, Canada.

The cash value of these discoveries cannot be estimated, he said, but the knowledge gained in the world-wide scientific investigation of the planet earth will give man a better control over his environment.

Science News Letter, November 10, 1956

## GEOPHYSICS

### H-Bomb Reactions Occur High in Atmosphere

► H-BOMB REACTIONS occur high in the earth's atmosphere at the time of northern lights or auroras. The reactions are not caused by fallout from hydrogen bomb tests but by tiny charged particles hurled earthward by the sun.

Studying the high level thermonuclear reactions would be a new method for learning about auroras, Dr. S. F. Singer of the University of Maryland suggests. He reports plans to use, about the first of next year, an especially equipped airplane flying near 50,000 feet to try to detect the solar-caused effects.

An earth-circling satellite coated with one of the light elements could also be used to spot the effects, Dr. Singer says.

He believes the "most important" of the reactions is the capture of protons by nitrogen in the upper atmosphere, releasing large amounts of energy.

Very high speed particles, particularly protons, thrown out by the sun cause a "relatively small" number of thermonuclear reactions, he proposes. They also are believed to cause the shimmering displays of auroral color and ionization of the atmosphere at high altitudes.

Penetrating gamma rays produced by the capture of protons by nitrogen indicate the nature and energy of the incoming particles.

These nuclear effects must be considered in designing space satellites, Dr. Singer says. If gamma ray production is undesirable, the satellite's surface should be coated with an element of relatively high atomic number.

On the other hand, by using two Geiger counters, one coated with one of the light elements and the other uncoated, detectors for solar protons of the desired energy can be constructed, even though low-energy protons alone could not penetrate the skin.

Science News Letter, November 10, 1956

## MEDICINE

### Four "Blue Babies" Now Are Mothers

► THE FOURTH CASE on record of a woman who was a "blue baby" now having achieved motherhood was reported by Drs. Jack M. Kaufman and Paul Ruble of Detroit at the American Heart Association meeting in Cincinnati.

Before "blue baby" operations became available in 1945, children with congenital heart defects could expect to live a dozen or score of years at most. Now they are living to the age when they can marry and begin raising families of their own.

"Women with heart disease can safely become pregnant," the doctors said. "There is no cardiac indication for abortion. Heart surgery if necessary may be performed quite safely during pregnancy."

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