

BIOCHEMISTRY

**Blood Sugar Proteins
Clue to Cancer Cure**

► A NEW way of measuring sugar-containing proteins in the blood may give a means of telling whether treated cancer patients have been cured or not.

The test was developed by Dr. M. R. Shetlar of the University of Oklahoma.

Cancer patients, he has found, have more than the normal amount of these sugar proteins in their blood. After operation to remove the cancer, as after all operations, the amount goes still higher. In 30 or 40 days, the amount drops to normal if the operation has been successful in eradicating the cancer.

If the sugar proteins stay at the high level, it is a sign that the cancer has not all been removed. A drop in the amount of these special proteins in the blood after the operation, followed by a rise again, shows the disease has recurred.

The new blood test may show recurrence long before the patient shows any symptoms or the doctor finds any signs of recurrence.

The test is not a perfect blood test for cancer because it fails to show the presence of some small but obvious cancers, such as those on the skin. And since some other conditions, such as rheumatoid arthritis, rheumatic heart disease, severe infections and late pregnancy, also cause a rise in blood sugar proteins, the test can only arouse a suspicion of cancer.

A simple machine that can analyze nine different blood samples overnight, costing from \$200 to \$900, may make the testing practical for small hospitals and laboratories, says the American Cancer Society which has supported Dr. Shetlar's studies.

Science News Letter, March 27, 1954

BIOCHEMISTRY

**Sex Offenders Traced
Through Body Wastes**

► PSYCHOLOGICAL PATTERNS in certain sex offenses may be due to physiological conditions which, in turn, may be traced by measuring certain waste products excreted from the human body.

This is indicated in studies by Dr. Josephine Garst, University of California at Los Angeles Medical School chemist.

The investigation concerned the excretion rate of 17-ketosteroids by a group of sex offenders at the Metropolitan State Hospital. These substances are by-products of the gonads and adrenal cortex, and their excretion rate is an index of the activity of these organs.

Although results of the investigation were not clear-cut, data suggested that those sex offenders whose records included child molesting had a lower than normal excretion rate of 17-ketosteroids.

"This may indicate decreased gonadal function," says Dr. Garst, "which may contribute to a conscious or unconscious feeling of sexual inferiority. This feeling may

be one of the factors responsible for the sex offender's selection of a child partner for his sexual activities."

High day excretion rates of 17-ketosteroids by the groups were believed to reflect increased adrenal cortical stress. Since there was no undue physical stress, it was assumed the abnormal stress was emotional.

"Emotional instability indicated here may reflect various psychological stresses during previous experiences of the individual," Dr. Garst says. She emphasized that the findings are not conclusive, but suggest interesting speculation for future research.

Science News Letter, March 27, 1954

INVENTION

**Magnetic Paper for
Talking Mail Patented**

► TALKING LETTERS that can be mailed and filed like typewritten letters, but are played back like magnetic tape recordings, may revolutionize correspondence.

If inventor Bruce Roberts of Philadelphia has his way, a businessman will not call for Miss Smith to take a letter. He will put a sheet of magnetic letterhead on the recording machine, speak his piece, address and fold the letterhead and send it through the mails.

The advantages of the magnetic letterhead are that it can be handled as ordinary paper correspondence is handled while, at the same time, giving the directness of phonograph or tape recordings.

A thin layer of magnetizable material is bonded to the paper. The sheet is placed on a recording drum which rotates so that the speaker's voice is recorded on the sheet. Mr. Roberts states that the recording machine, for which he has a patent application, is made so that two sheets may be recorded together, yielding an original and a copy.

For the person who likes the written letter, the magnetic sheet may be used in place of present recording dictating equipment for ease of filing. The invention received patent No. 2,668,718, assigned to the International Electronics Co., Philadelphia.

Science News Letter, March 27, 1954

TECHNOLOGY

**Synthetic Gum Stops
Long Stirring of Paint**

► HOMEOWNERS WHO prefer water-based paints for indoor decoration may soon be spared the tedious task of stirring them for long periods before using.

A synthetic gum developed by the B. F. Goodrich Chemical Company, Cleveland, is said to increase the paint's thickness and to keep color pigments from settling in a lump at the bottom of the can.

The synthetic also can be used as an anti-caking agent for cosmetics, pharmaceuticals, inks, chemicals, latexes and other products containing water.

Science News Letter, March 27, 1954



PHYSICS

**Simple Device
Gives High Vacuum**

► A SIMPLE device that will give a high vacuum such as required for television and X-ray tubes has been built by Drs. A. M. Gurewitsch and W. F. Westendorp of General Electric Company's research laboratory, Schenectady, N. Y.

Known as an "ionic pump," the device has no moving parts and can produce a vacuum as high as one-billionth of normal atmospheric pressure.

The pump consists of a circular stainless steel box, about two inches in diameter and an inch thick, supported between the poles of a powerful magnet. After most of the air has been exhausted from the tube to which the pump is connected, the electric current is turned on.

Electrical forces break up, or ionize, the gas atoms and hurl the fragments into carbon plates at the sides of the pump, where they stick. Thus the gas is gradually removed until the desired vacuum is reached.

Science News Letter, March 27, 1954

CHEMISTRY

**Old Chemical Tool
Could Aid Diagnosis**

► A LONG-STANDARD chemical research tool could be put to a new use in such fields as diagnosing cancer, determining hormone levels and analyzing biological materials.

Dr. Robert Pecsok, assistant professor of chemistry at the University of California at Los Angeles, believes.

The instrument is the polarigraph, which uses electrical measurements to determine simultaneously the amount and nature of up to six substances without separation. It was invented in 1920 in Czechoslovakia. In 1937 it was introduced into the United States, and since that time has been used widely in chemical research.

It has, however, had little application in routine clinical problems. This is due, Dr. Pecsok believes, to the gap that exists between research with relatively pure compounds in known solutions and the extremely complex mixtures with which clinical chemists work.

"This gap can be bridged with the collaboration of those in the field of pure chemical research and the clinical chemists," he says. "Preliminary studies indicate that the polarigraph could be a valuable aid in detecting and following the course of cancer, in determination of levels of sex hormones and cortisone and in detection of lead or arsenic poisoning."

Science News Letter, March 27, 1954

CE FIELDS

BIOCHEMISTRY

Rat Leg Cartilage Key To Hormone Chemicals

► **CARTILAGE** IN a rat's leg is the key to a new method of measuring the growth hormone in circulating blood that plays a leading role in rheumatoid arthritis, one kind of diabetes and rheumatic fever.

Dr. Albert Segaloff at the Tulane University School of Medicine and the Alton Ochsner Medical Foundation, New Orleans, discovered the method.

It should prove useful in tracing body chemical "mistakes" in other diseases, including gigantism, dwarfism and even cancer. The growth hormone is produced in the pituitary gland at the base of the brain.

Extracts of blood plasma containing the hormone are injected into rats whose pituitary glands have been removed. The cartilage on the long bone of the rat's lower leg grows very quickly in response to the hormone. Dr. Segaloff measures the growth accurately to determine the amount of growth hormone in the blood sample tested.

A peculiar result of tests has been that some adults long past their prime show a great deal of blood growth hormone, while some growing children show little or none at all. This may be due to the tissues' rapid absorption and use of the hormone. The research leading to the measurement method was sponsored by the American Cancer Society.

Science News Letter, March 27, 1954

ORNITHOLOGY

Sonic Weapons Against Starlings Have Success

► **NEWEST WEAPONS** in the war against the pesky starlings are tape recorders and loudspeakers.

Dr. Hubert Frings and Joseph Jumber of Pennsylvania State University, State College, have cleared two towns of starlings using sound trucks broadcasting starling "distress calls."

They discovered while collecting starlings in barns that the birds shrieked when they were held and shaken. The shriek caused other starlings in the barn to leave and, over a period of months, the barn would remain free of birds.

The scientists recorded the shrieks with a tape recorder and began experimenting with broadcasts in individual trees. After several nights of shrieking for about 30 minutes before and after sunset, the trees were free of starlings and remained free.

These successes led to the use of two sound trucks in Millheim, Pa. After three nights of treatment, fewer than 100 birds remained in the small town. Similar treat-

ment in State College met with the same success. Both towns remained free of the starlings until the birds left the area for the winter, Dr. Frings and Jumber report in *Science* (March 5).

The broadcasts are disturbing to people if they are near the horns, but this is minimized since the loudspeakers are usually directed upwards.

Starlings are the split personalities of the bird world. On farms, they eat Japanese beetles, potato beetles, weevils, destructive caterpillars and other insects harmful to crops. But in towns and cities, they give officials, pedestrians, car owners and buildings fits.

Science News Letter, March 27, 1954

GEOLOGY

Airborne Surveys Spot Uranium Sources

► **ALTHOUGH IT** is conducting aerial surveys in the East for the A-bomb material, uranium, the Atomic Energy Commission chiefly is probing western states for commercial sources of the element, the AEC disclosed.

To date, airborne exploration in the West has touched South Dakota, Arizona, New Mexico, Utah and Colorado. Airborne prospectors have been able to spot areas showing unusual radioactivity in these states, and subsequent on-the-ground prospecting has turned the Colorado Plateau into one of the largest uranium-producing areas in the world.

Preliminary reports of an aerial survey begun in mid-February indicate that no new uranium deposits have been found in west-central New Jersey and eastern Pennsylvania. Plans call for aerial investigations of northern New Jersey and southeastern New York.

No uranium currently is being mined in the East. Uranium "occurrences" found by the U. S. Geological Survey and private explorers sparked the aerial prospecting of this area.

However, "occurrences" in uranium-bearing rock must be distinguished from "commercial deposits of ore," the AEC declared.

Science News Letter, March 27, 1954

ENGINEERING

Man-Made Sun Created To Serve Architects

► **A-MAN-MADE** "sun" in the form of a high-intensity light bulb running on an arched steel track has been created at Cornell's College of Architecture, Ithaca, N. Y., to help designers visualize the sun's effect on housing projects and buildings.

Models of the buildings under study can be illuminated by the "sun" for any latitude or time of day. Called the solatron, the architect's aid was designed by Prof. Frederick W. Edmondson, who teaches landscape architecture, and built by Robert M. Matyas, an architecture graduate.

Science News Letter, March 27, 1954

TECHNOLOGY

Supersonic Hypodermic Penetrates Four Inches

► **A SUPERSONIC** hypodermic device has been developed which hurls a tiny liquid jet through air at nearly twice the speed of sound. It could penetrate four inches of tissue.

Present medical needs do not call for more than one inch of tissue penetration in any injection. This can be met by existing devices. However, the new device may be used for direct injection into internal organs and tumors.

The instrument was developed by Dr. Benedict Cassen, Brian Dunne Jr. and Herbert Gass of the University of California at Los Angeles.

Liquid in a steel chamber is propelled through a .005-inch nozzle by the explosive action of a small wafer. The wafer is made from nitrosoguanidine, a heat-sensitive chemical, and is detonated by a small soldering iron in the device.

Experimentally, the supersonic liquid stream penetrated a telephone book to the depth of one inch. This is equivalent to a four-inch penetration of tissue.

Even at a depth of one inch, penetration was effected by a very small pinhole. Dye in the liquid indicated lateral diffusion from the pinhole.

Science News Letter, March 27, 1954

BIOCHEMISTRY

Old Gout Remedy Keeps Fat from Blood Stream

► **THE OLD** gout remedy, colchicine, causes a dramatic reduction in number of fat particles in the blood stream after rich food is eaten.

This discovery, by Dr. W. Edward Naugler and Beverly J. Brown of Stanford University's department of medicine, is considered a clue to the mystery of how colchicine acts to relieve gout sufferers.

Dr. Naugler thinks this chemical from the autumn crocus plant may act by causing a release of heparin from body cells in the intestines. Heparin, a normal body chemical, makes blood flow freely, helps prevent blood clots and rapidly breaks down fat into its fatty acid components.

In the Stanford studies, volunteers first drank cream without colchicine. A blood sample was taken several hours later. Then the volunteers drank cream after varying doses of the gout drug, and blood samples were again taken.

Fat droplets normally appear in the blood stream after fatty food, such as cream, is taken. However, the blood-fat condition, called lipemia, was 50% to 250% more pronounced when cream was taken without colchicine.

The scientists conclude that colchicine has a peculiar affinity for the intestine, apparently acting to prevent transfer of fat from intestine to blood stream.

Science News Letter, March 27, 1954