

PHYSIOLOGY

Chemical in Urine Shows Radiation Effects

► A WARNING signal that could be used to indicate whether the body has been damaged by radiation is reported by a team of Czechoslovakian researchers.

Studies with rats showed irradiation causes an increased excretion of a substance which is related to deoxyribonucleic acid, or DNA, an essential compound found in the living cell.

Other stresses such as physical restraint or bone fractures do not produce the same results, the scientists report in *Nature* (Sept. 13). The scientists say that within a certain dose-range the amount of deoxycytidine, a compound containing deoxyribose, excreted during the first 24 hours after irradiation depends on the irradiation dose used.

Excretion of deoxycytidine can thus become a new sensitive indicator of post-irradiation changes, they conclude. It may also be useful in evaluating methods of protection against ionizing radiation. "Damage can be detected earlier and much more simply than with the diagnostic methods in use at the present," the scientists point out. The presence of the deoxycytidine could be detected even after low irradiation doses.

The scientists believe irradiation causes either increased release of deoxycytidine from DNA or that it accumulates because the synthesis of DNA is stopped.

J. Parizek, M. Arient, Z. Dienstbier and J. Skoda, all of Prague, reported on results of their research.

Science News Letter, October 4, 1958

CONSERVATION

Virgin Prairie Land Set Aside for Research, Study

► UNBROKEN PRAIRIE lands took on a new importance in the jet age as scientists and conservationists gathered to dedicate 160 acres of land that has never been cut by the plow.

The Tucker Prairie Research Station near Columbia, Mo., has been established to preserve one of the few remaining tracts of natural prairie land in the United States. Here, Dr. Alan T. Waterman, director of the National Science Foundation, pointed out, scientists will be able to observe the essential role environment plays in the study of biology.

The study of living things in their natural environment rather than in the laboratory is attracting more and more scientific interest. However, natural environment is becoming rare in the face of the steady and uncontrolled growth of urbanization and mechanization, Dr. Waterman said.

It is now obvious, he explained, that the "survival of natural environments cannot be left to chance but must be the subject of organized effort, supported, where necessary, by local and Federal Government."

Commending the University of Missouri for its activities in preserving the Tucker prairie, Dr. Waterman also described the

crucial role universities play in preserving natural resources. They participate in three ways: establish fundamental principles through basic research; encourage and train biologists to become ecologists; and support and influence local and national policies that will "insure effective land utilization and preserve irreplaceable natural resources."

The research station will be a joint state-University activity, where soil, animal and plant studies of a typical wet-grass prairie area can be studied.

The National Science Foundation contributed \$19,000 toward the purchase of the tract of land. Conservation groups and private individuals interested in the preservation of a piece of untouched prairie land also contributed.

Science News Letter, October 4, 1958

PUBLIC HEALTH

94 Paralytics Received Salk Vaccine Series

► APPROXIMATELY 94 cases of paralytic polio have been reported since January in persons who had received the entire series of anti-polio shots.

The fact that the polio vaccine did not protect these people from the crippling virus could be attributed to several causes.

First, the shots may not have been received in proper sequence, Dr. C. C. Dauer, medical adviser of the National Office of Vital Statistics, said. The first two shots must be taken one month apart while the final shot must be taken not before seven months have elapsed after the second shot.

Secondly, the vaccine itself is not guaranteed to be 100% effective. The percentage of satisfactory immunization ranges somewhere between 70% and 90%.

The third cause for failure of the vaccine to protect is the recognized fact that if a year has elapsed since the administration of the polio shots, the effectiveness may diminish. Exposure to a severe epidemic of the virus can then overcome the vaccine's potency.

During polio outbreaks, people tend to rush for their polio shots, thinking that the vaccine will quickly ward off any chance of contracting the disease. Unfortunately, this last minute dash will not give adequate protection, public health experts warn. The shots must be staggered over the proper time period before they can become effective.

Only 2,220 cases of paralytic, non-paralytic and unspecified poliomyelitis were reported for the whole population of the country in the 35 weeks ending Aug. 30. The total last year at this time was 3,879. The marked decline in the frequency of cases in the last two years may be attributed in large measure to the widespread use of the Salk vaccine.

Despite this encouraging news, the fact remains that 44,000,000 persons under the age of 40 still lack proper protection. Currently scientists are working on the development of a more potent vaccine that may give lasting immunity. The duration of protection offered by the Salk vaccine is still unknown.

Science News Letter, October 4, 1958

IN SCIEN

GEOPHYSICS

Lowest Temperature Recorded by Soviets

► THE WORLD'S lowest temperature, 124.1 degrees below zero Fahrenheit, was recorded on Aug. 9, 1958, by Russians at Sovietskaya, their Antarctic base.

This low temperature record from the world's "icebox" is within approximately six degrees of the coldest scientists calculate the earth might ever reach, or minus 130 degrees Fahrenheit. Edwin Flowers of the U. S. Weather Bureau told SCIENCE SERVICE of the new world's record low temperature.

The extreme altitude of Sovietskaya, some 12,000 feet, probably accounts for the very low temperature recorded there. Russian stations high inland in Antarctica have consistently been setting record lows during 1958, the first year of their operation.

For instance, in June, the beginning of the Antarctic winter, three successive records were set. At Vostok, about 11,500 feet above sea level, the thermometer hit minus 113.3 degrees Fahrenheit on June 15. Only four days later the mercury fell to minus 113.8 degrees at Sovietskaya, and on June 25 it plunged to minus 117.4 degrees at the same station.

Science News Letter, October 4, 1958

PUBLIC HEALTH

Radioactivity in Milk Is Within Permissible Levels

► LATEST TESTS for the presence of radioactivity in milk show that the amounts of strontium-90 fall "well within the permissible levels recommended by the National Committee on Radiation Protection and Measurement."

Amounts of other radioisotopes, including cesium-137, iodine-131, barium-140 and strontium-89, also were under the limits set as safe over a lifetime, the U.S. Public Health Service has announced. The tests include results from four new stations in Georgia, Texas, North Dakota and Illinois. They represent milk samples collected through May, June and July.

Although dose levels established by the radiation committee are for water, Public Health officials point out that they are generally accepted as being applicable to milk.

Levels of strontium-90 in milk ranged from about three to ten micromicrocuries per liter in May to about three to 18 micromicrocuries in July. The permissible limit is 80 micromicrocuries per liter. A micromicrocurie is one-millionth of a millionth of a curie. A curie is equal to the radioactivity produced by about one-thirtieth of an ounce of radium.

Science News Letter, October 4, 1958

CE FIELDS

MEDICINE

Report Tests of Oral Diabetic Drug

► **CHLORPROPAMIDE**, an oral drug for treating diabetics, has longer lasting effects and is twice as powerful as other agents now available.

The drug, called Diabinese by its developer, Chas. Pfizer & Co., Inc., is not yet available for general use, although it has been tested on more than 5,000 patients.

At the opening session in New York of the Conference on Chlorpropamide and Diabetes Mellitus, sponsored jointly by the New York Academy of Sciences and Pfizer, studies showing that Diabinese remains in the blood stream of a patient for 72 hours after a single dose were reported. The research by Drs. Philip Johnson, Allen Hennes and Kelly M. West of the University of Oklahoma also showed that the body does not appear to alter the drug chemically before excreting it.

The studies were made with a form of chlorpropamide tagged with radioactive sulfur-35.

Dr. West and Dr. Stanley R. McCampbell, also of the University of Oklahoma, compared the drug's effectiveness in lowering blood sugar levels with tolbutamide, at present the most widely used of the sulfonylurea pills. They found that two hours after the first dose, Diabinese produced lower blood sugar levels than did tolbutamide. Only half as much of the new drug was needed to produce the same lowering of blood sugar.

Diabetes is a metabolic disease known for some 3,500 years whose cause is still unknown.

Until 1922, when insulin was discovered, only dietary restrictions were available to help the diabetic. Since then, daily injections of insulin enable virtually all diabetics to lead normal lives. Oral insulin substitutes have been used to control the most common form of diabetes in some persons.

Science News Letter, October 4, 1958

ANTHROPOLOGY

Movies and Records Aid Anthropologist's Work

► **THE MOTION PICTURE** camera and the tape recorder are going into the jungles, deserts and other remote areas of the world to become the right hand of the anthropologist.

With photographs, motion picture film and tape recordings, the anthropologist has a permanent record of the activities of the primitive people he is studying. The existence of such records has meant that anthropology could take a giant step forward in solving some of its own "peculiar" problems, Dr. Margaret Mead, noted anthropologist, said.

It is now possible to begin microcultural

studies (the study of individuals and small groups within cultures) without the limitations of 25 years ago. Previously, observations of primitive peoples were mostly written and thus susceptible to all kinds of translation and interpretive difficulties. Only the observer's words and impressions of the group he was studying were available. Checks on reliability and validity of his observations were difficult or non-existent.

Dr. Mead explained to an audience gathered in Washington to hear the first talk in the new Washington Science Lecture Series that it is now possible to trace and compare observations of individuals. Cross-checking, comparing an individual's behavior at different times or comparing two persons' behavior under the same circumstances, has become more effective, imparting some objectivity to the science of anthropology.

Illustrating her lecture with slides of an Admiralty Islands society taken 25 years apart, Dr. Mead showed how the camera contributed to the scientist's research. With the anthropologist's study material being rapidly destroyed as surviving primitive peoples disappear, it has become even more necessary to make as objective studies of these peoples as possible.

Thus, Dr. Mead explained, we are beginning to see a change in anthropology as the methodology—the means for gathering facts and observations—assumes new importance. Anthropology began as a simple description of the activities and relations of peoples. Problems were raised because the science was dependent on human beings in their natural environment. The camera and recording machine have brought many observers to the scene and made repeated study of the material possible.

Science News Letter, October 4, 1958

PHARMACOLOGY

Chemical in Licorice Root Depresses ACTH Output

► **THE STUFF** that makes licorice root sweet may turn out to be a useful drug.

It acts very much like desoxycorticosterone, a chemical relative of the adrenal hormone cortisone, Dr. Shirley D. Kraus of the Brooklyn College of Pharmacy reports.

Experiments with mice subjected to the stresses of cold and hunger showed that when the animals were given the licorice root compound, glycyrrhizin, their resistance to stress was greatly reduced. Since cold and hunger are believed to increase the adrenal gland's activity through release of ACTH, Dr. Kraus points out that glycyrrhizin may depress the output of ACTH.

Desoxycorticosterone also depresses ACTH release. Earlier studies have shown the licorice substance can replace desoxycorticosterone in treating persons who have had their adrenal glands removed or persons afflicted with Addison's disease.

Dr. Kraus' research, reported in the *Journal of Experimental Medicine* (Sept. 1) published by the Rockefeller Institute, is further evidence of the similarities between the two substances.

Science News Letter, October 4, 1958

PHYSIOLOGY

X-Ray Shows Basic Step In Muscle Contraction

► **X-RAY PROOF** of the change that takes place in muscle protein when the muscle contracts was presented by a scientist.

Working with the fiber-like protein actomyosin, extracted from fish muscle, Dr. F. G. E. Pautard of The University of Leeds department of biomolecular structure reports that he obtained "X-ray indications of a transformation of a proportion of the protein into the supercontracted state."

This points to changes in the protein chain that makes up actomyosin.

The addition of ATP, an important energy-carrying compound found in all cells, to actomyosin when it was in a jelly-like form caused the muscle protein's shrinkage and contraction. The X-ray pattern of the ATP-treated actomyosin gel showed fundamental changes in the muscle protein.

Untreated gels could easily be stretched and had a characteristic X-ray pattern, the scientist reports in *Nature* (Sept. 20). ATP-treated gels were brittle and not easily handled. However, upon further treatment, specimens of the muscle protein showed changes in its X-ray pattern.

ATP is the name given to adenosine triphosphate.

Science News Letter, October 4, 1958

PUBLIC HEALTH

Find Possible Danger In "Safe" Water

► **DUCKS** have turned out to be unusually good in a deadly business: concentrating radioactive cesium.

Their muscles tissue can concentrate cesium-137 about 2,000 times over the level present in the water, Dr. Robert C. Pendleton and Wayne C. Hanson of General Electric reported to the Second United Nations International Conference on the Peaceful Uses of Atomic Energy meeting in Geneva.

The ducks are not alone in their exceptional concentrating powers, however. Algae concentrate cesium-137 1,200 times over the water's level, bullrush seeds concentrate it 70 times. As a result, the scientists reported, water perfectly safe to drink might still contain thousands of times too high a level of radioactive isotopes if the water is also a source of food.

By constructing an artificial pond in which they duplicated a natural pond environment, the scientists were able to study the effects of cesium-137 on living organisms in a typical aquatic community.

Within 50 hours after the radioactive cesium had been added to the water, 95% of it had been removed by the algae, plants and animals; 99% was removed in five days.

Dr. Pendleton said that results of the experiments show aquatic plants accumulate cesium-137 about 500 times as much as plants grown in soil. He also pointed out that carnivorous animals concentrate the radio-isotope to higher levels than animals that eat plants.

Science News Letter, October 4, 1958