PHYSICS

Warmed Diamonds Transmit Electricity

➤ ALL BLUE diamonds and some others, when heated to a few degrees above ordinary temperatures, transmit electric current in one direction. They act like crystals of the semi-conducting metal germanium, now in demand for transistors in electron circuits.

Studies of the electric properties of diamonds, revealing a new classification, IIb, for the kind which are semi-conductors, were described in *Nature* (July 23) by Dr. J. F. H. Custers of the Diamond Research Laboratory, Johannesburg, South Africa.

Other diamonds of similar type, classified as IIa, are electrical insulators, conducting no current at all, Dr. Custers reported.

Up to now diamonds have been divided by physicists into two classes, called I and II, according to the pattern of X-rays scattered by their crystals.

Impurities in class I diamonds are believed by some physicists to account for the differences between the two classes. The crystals of class II are believed to be purer and more regular. Impurities would, therefore, not account for the difference in conductivity of the two kinds of class II diamonds found by Dr. Custers. He believes that semi-conducting diamonds may be due to slight defects in the crystal lattice.

Science News Letter, August 6, 1955

PUBLIC HEALTH

Danger of Glass In Food After Blast

➤ AFTER A NUCLEAR EXPLOSION, even a baby atom bomb, glass may show up in food that seems otherwise safe.

This is one of the lessons from the pantry shelves of Doom Town after the 35-kiloton "pipsqueak" nuclear explosion during Operation Cue in Nevada recently. It was reported to a Food and Drug Administration staff meeting by Dr. Edwin P. Laug, project leader for tests of the explosion's effects on foodstuffs.

One mile from ground zero, food found in physically intact containers should be safe to eat, Dr. Laug said. But he has seen glass splinters driven by the blast wave through a can of tomatoes. Oranges that looked perfectly all right had glass splinters in them.

Possible food contamination is another danger.

The blast could loosen the cap on a jar of baby food unnoticeably, yet allow contamination.

Fallout is not the only danger to foodstuffs after a nuclear explosion. Radioactive dust can be wiped off the outsides of containers, but the second danger cannot be wiped off. It is from neutrons, which cause anything in their path to become radioactive, Dr. Laug said.

Amount of this induced radiation in foods would depend, among other things, on the content in the food and its container of certain elements, such as sodium, potassium, calcium, tin, phosphorus, sulfur and chlorine.

Final report on what happened to the 15 tons of different foodstuffs exposed during Operation Cue will not be ready for some time. Meanwhile 60 rats will be eating baby foods from the test for the next six months and another 60 will be eating a synthetic diet made from radiation-exposed bulk foods such as flour, salt, sugar, etc.

Food one-fourth of a mile from a nuclear explosion such as that of Operation Cue may be radioactive but the risk of eating it could be measured. Persons eating it could take the calculated risk of eating it rather than starving.

Science News Letter, August 6, 1955

BIOCHEMISTRY

Red Blood Cells of One Group Can Be Changed

➤ HUMAN RED BLOOD cells of one group can be transformed into another group.

Announcement of this exception to the general rule that blood groups are a permanent part of the red cell and persist throughout its lifetime was made by Dr. Joan S. Sneath of the Medical Research Council's Blood Research Group at Lister Institute, London, and Dr. P. H. A. Sneath of the National Institute for Medical Research, London.

Red blood cells keep their ABO, MNS, Rh and several other characteristic antigens throughout life. The antigens are the substances distinguishing blood groups.

The transformation reported by the two Drs. Sneath is for the Lewis antigens, or blood groups. They were discovered in 1946 and one of them, Le-a, is the only blood group antigen yet known that is inherited as a Mendelian recessive character.

Human blood from adults may have Le-a and no Le-b, it may have Le-b and only a trace of Le-a, or it may lack both b and a of the Le group.

Blood from an Le-a positive b negative donor was transfused to a patient with Le-a negative b positive blood. A sample of blood from the patient after transfusion showed the donor's cells had become Le-a and b positive.

This transformation of donor's cells to another blood group has not been found in the cases of other groups. The transfused blood cells keep their own group in other than Lewis blood groups.

The Lewis group transformations can be achieved in the test tube by mixing red cells and plasma of different Lewis types.

It seems possible, the scientists said in *Nature* (July 23), that red cells simply absorb the Lewis antigens in life, that is, the Le-a positive cell gets some Le-b antigen stuck onto it. The system's fundamental expression, they believe, is found in blood antigens, not the cells.

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IN SCIEN

OCEANOGRAPHY

No Submerged Continent In Pacific or Atlantic

➤ NEITHER the Atlantic nor Pacific Oceans hide a submerged continent, three scientists from Lamont Geological Observatory, Palisades, N.Y., have found.

They investigated the properties of the two sub-oceanic floors by studying earthquake records. These revealed no "areas of continental proportions" that might once have stood above sea level, Drs. Jack E. Oliver, Maurice Ewing and Frank Press concluded.

Both the Pacific and Atlantic ocean floors have a sedimentary rock layer about three-tenths to six-tenths of a mile thick, the oceanographers found. That part of the Pacific known as the Easter Island Rise, they suggested in the *Bulletin of the Geological Society of America* (July), differs and may lie over a thin layer of continental-type rock.

Science News Letter, August 6, 1955

BIOCHEMISTRY

Chinese Body Chemistry Different From Caucasian

➤ DISCOVERY of a "highly significant" difference in body chemistry between Chinese and Caucasians was announced by H. Eldon Sutton and Philip J. Clark, University of Michigan biologists.

The difference is that Chinese excrete significantly greater quantities of amino acids than Caucasians. Diet is not a principal factor in this difference.

Amino acids are sometimes called building blocks of protein. Eating and environment both play substantial roles in amino acid production, the Michigan scientists pointed out. However, they believe the difference they discovered in amino acid excretion is basically hereditary and racial.

The Chinese studied had been living under Western conditions for at least two years. Two of them were native Americans. Yet urinary samples, after a series of delicate laboratory tests, fell into distinct racial categories.

"It was found that the amino acids most influenced by the change to a uniform diet were the ones which show considerable individuality in excretion patterns, and the individuality did not decrease significantly when the subjects consumed identical foods," the scientists said.

They maintain the world is divided into huge racial chemical factories whose products may resemble one another but which, after careful analysis, are found to be truly unique and distinctive.

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CE FIELDS

PHYSICS

Find Light Source in Atomic Phosphorescence

➤ THE NAVY is testing a phosphorescent light source that can burn continuously for years without electricity or batteries.

With it, a sailor can read maps, orders and instructions in total darkness when ordinary light is not desirable or available. The light burns continuously from the energy of radioactive strontium 90 particles bombarding phosphors, which are chemicals that glow.

Night fishermen, campers, ushers and car owners may find such a lamp useful, if they become available commercially. In mass production it is estimated that the lamps would cost only a few dollars each.

A lamp that gives light ten times as bright as moonlight on a clear night has been made. Even a hand light one-sixth as powerful as this would enable a person to find his way around in the dark, Dr. L. J. Boardman of the Naval Research Laboratory's optics division said.

Use of radioactive isotopes to excite the phosphors is seen as a way to eliminate cumbersome power sources and electrical equipment in some military applications.

Phosphor lamps have been created that give off a variety of colors, but green and yellow-green seem the brightest to the observer and are the only colors being considered.

There is a radiation danger and caution must be taken in handling the phosphor lights, since they contain radioactive strontium 90. An effective cover design for the lamp and care in using the light would completely eliminate the problem, Dr. Boardman said.

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BIOCHEMISTRY

Synthesize Hormone Of Adrenal Glands

➤ TOTAL SYNTHESIS of racemic aldosterone, said to be the most potent hormone of the adrenal glands, by Dr. A. Wettstein, director of research for CIBA Ltd., and Dr. J. Schmidlin of CIBA's research laboratories at Basel, Switzerland, was announced at the 14th International Congress of Pure and Applied Chemistry at Zurich.

The accomplishment will result in larger amounts of the hormone for clinical studies. Thirty chemical steps were required to produce the new hormone synthetically.

Two years ago, scientists of Basel University, CIBA research laboratories and Middlesex Hospital in London succeeded in isolating aldosterone in pure crystalline form. It is the last important natural hormone to be extracted from the cortex of the adrenal gland, located astride the kidneys.

Pharmacological and clinical investigations subsequently established the significance of aldosterone in medicine. Biological work was impeded, however, because a ton of animal adrenals had to be processed by complicated fractionation methods to obtain only 50 milligrams of the hormone.

Aldosterone is so potent that minute amounts will maintain life in patients with adrenal disease. Its greatest effect, according to Dr. Robert Gaunt and his associates studying the hormone at CIBA Pharmaceutical Products Inc. of Summit, N. J., is to prevent loss of salt through the kidneys, sweat glands and saliva.

The compound has some but not all of the actions of the well-known hormone cortisone. Unlike cortisone, its secretion is not regulated by the pituitary hormone, ACTH.

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BIOPHYSICS

Radiation Makes Rats Avoid Sweet Water

➤ RATS that ordinarily like saccharin-sweetened water develop a "striking aversion" to it after they have had it to drink during exposure to gamma radiation.

If the radiation dose is not very large, the animals merely fail to show their previous preference for sweetened water. But if the radiation dose is large, the animals develop a striking aversion to sweetened water that lasts 30 days or longer.

Radiation, studies by Navy scientists showed, is able to act as an unconditioned stimulus.

Previously the scientists found that animals ate and drank less during exposure to a relatively low dose of low-intensity gamma radiation. They ate and drank less and less with successive exposures to radiation, although between exposures they ate and drank as much as or more than non-irradiated animals.

This suggested, and the saccharin studies further showed, that the change in drinking and eating is a conditioned response to radiation.

The conditioned response in these studies depends on taste. It may, however, be a sign of broader disturbances in behavior. Since radiation is known to disturb digestive functions, the radiation-conditioned response of decreased eating and drinking may be learned by the animal because of the disturbed digestive functions during irradiation.

Further studies to learn more about radiation as an unconditioned stimulus are in progress.

The saccharin studies were reported by Drs. J. Garcia, D. J. Kimeldorf and R. A. Koelling of the U. S. Naval Radiological Defense Laboratory, San Francisco, in *Science* (July 22).

Science News Letter, August 6, 1955

ARCHAEOLOGY

Oldest Mississippi Village Occupied 2700 Years Ago

➤ STONE AGE American Indians lived in a geometrically laid out village and understood something of astronomy 2,700 years ago, Dr. James A. Ford of the American Museum of Natural History has reported.

The village site studied by Dr. Ford, working with Dr. Junius B. Bird, also of the American Museum, and Dr. Stewart Neitzel of the Louisiana Parks Commission, is said to be the oldest known village in the lower Mississippi Valley. It was inhabited between 800 B.C. and 400 B.C.

The village remains make a half octagon about three-quarters of a mile in diameter. The houses were built on artificial ridges that formed concentric octagons.

Striking finds near the village are two great earth mounds with shapes of flying birds. One giant bird appears to be flying due north, the other, due west. The larger, even after centuries of erosion, still looms 70 feet above the surrounding plains. The other is 56 feet high.

The earth of the mounds still shows imprints of baskets used to carry clay for their construction.

The Stone Age village people who built the bird mounds had their origin in Asia and came to America by way of the Bering Strait, Dr. Ford concluded from studying objects found in the village.

Among the finds was a fragment of tubular pipe similar to pipes used in connection with magic cures in northeast Asia for several milleniums, Dr. Ford said. It is not a smoking pipe, but was used for blowing and sucking in the practice of primitive medicine.

The oldest village is at Poverty Point on the Bayou Macon, five miles northeast of Epps, La.

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BIOCHEMISTRY

Vitamin Involved In Thyroid Disease

➤ A HINT that anti-anemia vitamin B-12 might be good medicine for persons with the kind of overactive thyroid gland condition known as thyrotoxicosis appeared in a report by three scientists in *Nature* (July 23).

The scientists are Prema Fatterpaker, Urmila Marfatia and A. Sreenivasan of the University of Bombay, India.

Their research started from the theory that vitamin B-12 may function in overactive thyroid conditions by restoring, in part at least, the energy-requiring functions of impaired cells.

Studies with rats made to have overactive thyroids and with normal rats led the scientists to conclude that the primary manifestation of thyrotoxicosis is a vitamin B-12 deficiency.

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