



**GOT THE TIME?**—One of the new "atomic clocks" which are the most accurate time-measuring devices in the world is controlled by oscillation of cesium atoms. (See SNL, Feb. 5, p. 83.) The device developed by Dr. Jerrold R. Zacharias, director of the Laboratory for Nuclear Science at MIT, was built as a scientific tool for communication, astronomical, navigation, and geophysical studies. He is working on a new model so precise that if it had been running since the birth of Christ it would be only a half second "wrong."

#### MEDICINE

## Drugs Near A-Blast Safe

➤ IN THE event of an atomic bombing, drugs as close as 1,000 yards to the explosion will be safe for immediate use if their containers have not been damaged.

Only exceptions are insulin for diabetes and vitamin B-12 for pernicious anemia.

This reassurance comes from the U. S. Food and Drug Administration which tested 42 common drug preparations exposed to two shots in the Upshot-Knothole series of bomb tests in Nevada in the spring of 1953.

Insulin was reduced in potency by about 10% and vitamin B-12 by about 50%. Protamine zinc insulin, however, showed no reduction in potency of heavily exposed samples.

The drugs tested included ether; salt and sugar solutions and the blood extenders dextran and PVP, all of which might be needed to treat shock; morphine and some other pain-relieving drugs, including aspirin; amyl nitrite, nitroglycerin and a digitalis preparation for heart diseases; a sulfa drug and the chief antibiotics for fighting disease germs; cortisone; two stomach ulcer medicines; the sleeping pill phenobarbital and its relative thiopental sodium often used as an anesthetic; and rickets-preventing vitamin D for babies and small children; anti-bleeding vitamin K, and folic acid.

Many of the drugs did become radioactive. This induced radioactivity was still present several months later. A significant

amount of it was due to chemicals, such as calcium phosphate, used to give the drug chemical form or consistency for use as a medicine. Some was due to minerals in the drug itself.

All the chlorine-containing drugs, such as the salt solutions and some others used to inject fluids into the veins, become radioactive by transmutation of some of the chlorine to sulfur 35.

Clear glass containers that were heavily exposed turned quite dark. This was due to induced radioactivity and could serve as a warning signal that the bottle or jar had been exposed to heavy doses of radioactivity.

The amount of radioactivity induced in the drugs was so slight that there would be little or no health hazard from it in the normal use of the drugs. However, there might be danger in use of massive doses of atropine to combat nerve gas poisoning and in use of large amounts of some of the fluids given into veins to combat shock.

Drugs with a high sodium content should be allowed to "cool" several days after exposure before they are used.

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The prairie chicken, once numerous over large areas from the Appalachians to the Rockies, is now so scarce that only two states, Nebraska and South Dakota, allow hunting of the birds.

#### PHYSICS

## Rubber Is Vulcanized With Gamma Radiation

➤ RUBBER VULCANIZED without heating and without addition of sulfur has been produced by exposing an experimental rubber to the short gamma rays given off by cobalt 60.

New possibilities for vulcanizing rubber machine parts in place, by bringing the cobalt source of gamma rays to the job, may be foreshadowed by the discovery of this new method. The use made of it at present by the Air Research and Development Command is in making special rubbers which are not harmed by hot oil or made brittle by cold weather.

Fillers such as carbon black and zinc oxide, which improve the quality of rubber for tires and other large scale consumer uses, also improve the rubber cured by the new irradiation process. But the traditional method of vulcanization, discovered by Charles Goodyear, has been matched by atomic radiation similar to X-rays.

Working at the laboratories of the Air Research and Development Command at Wright-Patterson Air Force Base, Dayton, Ohio, the discovery of the new process was made by Wallace Jackson Jr., of Springfield, Ohio, materials and chemical engineer, and Denver Hale, of Dayton, who made the gamma-radiation research. The research team discovered the new process while trying to harden a new type of experimental rubber, one of a number of synthetic formulas not yet ready to be announced.

After conventional methods of hardening the experimental rubber failed, gamma rays were tried as a last resort. Success with the unusual experimental rubber prompted the research team to try the gamma ray technique on other synthetic and natural rubbers. Only one kind, a synthetic rubber known as poly-iso-butylene, proved resistant to the new vulcanization method.

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#### AGRICULTURE

## Oiling Dried Alfalfa Saves Vitamin's Parent

➤ ALMOST HALF of the nutrient in alfalfa meal needed by poultry and livestock to make vitamin A can be saved by treating the meal with animal fats.

The nutrient is carotene, a pro-vitamin that animals convert into vitamin A, needed for good growth and reproduction. When alfalfa is cut and dried and then stored as a feed meal, as much as 50% to 75% of the carotene combines with oxygen and disappears.

U. S. Department of Agriculture scientists reported in *Agricultural Research* (Jan.) that in recent tests the meal treated with five percent of animal fats retained nearly twice as much of the carotene as did untreated meal.

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