



**FIRST GROUND LAUNCHING PHOTO**—The Ryan "Firebee" is shown as it is launched from a 60-foot rail with aid of a rocket to boost it to flying speed. A second or two after launching, the jet engine takes over as power source for the pilotless jet plane. (See SNL, Feb. 14, p. 101.)

## PHYSICS

## Glancing Nuclei React

➤ TWO ATOMIC hearts can have a mutual reaction even though they merely brush by each other.

This discovery at the Massachusetts Institute of Technology is believed by the scientists responsible to be the first experimental evidence that atomic nuclei can undergo reactions without actually being struck. Dr. Clark Goodman, associate professor of physics, and Clyde McClelland, research assistant, accelerated hydrogen nuclei or protons by one to two million volts in a Van de Graaff-type electrostatic generator.

These fast-moving protons, passing near, but not striking, the nuclei of any of several heavy elements, including tantalum and platinum, caused the heavy materials to give off high-energy X-rays, they report in *Physical Review* (Aug. 1).

The protons, Dr. Goodman explained, had such low energy that "they could never get near enough to do more than wave at the heavy metal nuclei." Yet they clearly produced high-energy X-rays, or gamma rays, which were measured and counted by a scintillation spectrometer.

"Putting this reaction on the same scale as our solar system," Dr. Goodman said, "it is as though a large meteorite, about half as big as the moon, whizzed by the earth at a distance of about 30,000 miles. The gravitational effect would create enormous wreckage on the earth's surface, even though our planet were never actually struck. In the same way, the electrical

effect of our fast-moving protons may be quite large though they never actually strike the nucleus."

These results, according to the M.I.T. workers, have been anticipated by the theoretical studies of several scientists, including Prof. E. Guth at the University of Notre Dame and Prof. Victor Weisskopf at M.I.T. The M.I.T. discovery has already been confirmed by scientists in Denmark, at Duke University, Durham, N.C., and the Canadian atomic energy laboratories at Chalk River, Ontario.

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## TECHNOLOGY

## Magnified Grease Spot Shows Internal Structure

See Front Cover

➤ AN UNUSUAL view of what makes our modern civilization roll is shown on the cover of this week's SCIENCE NEWS LETTER. It is a spot of grease, of less than a cross-section of human hair in size, as seen when magnified 20,000 times by Dr. R. T. Koenig of the Gulf Oil laboratories, Harmorville, Pa. The rope-like strands are soap crystals, which contribute to slipperiness by holding oil in the grease compound. The photo is one of a series in a study to develop more efficient greases.

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## PHYSIOLOGY

## Coffee Fragrance More Stimulating Than Onion

➤ COFFEE APPARENTLY has a more powerful smell than onions or camphor. At least, it causes a greater response on brain wave recordings.

Studies showing this were reported by Drs. Carl W. Sem-Jacobsen, Reginald G. Bickford, Henry W. Dodge, Jr., and Magnus C. Petersen of Rochester, Minn., at the Third International Congress of Electroencephalography and Clinical Neurophysiology in Cambridge, Mass.

Electroencephalography, known as EEG for short, is the science that deals with recording electrical activity accompanying nervous activity in the brain. Electroencephalograms, or brain wave records, are showing doctors many things about human brain activity.

The Rochester doctors took recordings from the region of the olfactory bulb, where the nerve of smell expands in the brain. The largest amplitude responses were obtained when the patient's olfactory bulb was stimulated by the smells of valerian, coffee, lilac perfume, cloves, benzene, peppermint, lavender and lemon. A moderate response came from smelling wintergreen, onion, turpentine, camphor and cinnamon. Room air, acetone and alcohol were almost without effect.

The response was apparently reduced, but not entirely abolished, when the patient was asleep. No characteristic frequency of brain waves, however, was found for any of the substances tested. So the doctors conclude that telling odors apart apparently is not done by a frequency sensitive nerve cell system.

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## HORTICULTURE

## Lily Bulb Storage Easier With Plastics

➤ LILY BULB growing, a million-dollar-a-year business, may be in for a boost, thanks to plastics.

Lily bulbs stored in cases lined with polyethylene sheeting stand storage conditions better and yield stronger plants with more blooms, reports Dr. Neil W. Stuart, physiologist of the U.S. Department of Agriculture.

Dr. Stuart's tests showed that for long storage of bulbs in plastic-lined cases, shredded-peat packing material can be left at about 50% of its total moisture capacity. In this way, the peat is prevented from drying out and the bulbs from rotting when the packing material is too wet.

Several varieties of Easter lilies, Dr. Stuart found, benefit particularly from the plastic-sheeting treatment, because of the long storage they require. For shorter storage, a higher percentage of moisture can be added to the plastic-lined cases.

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