

## GENERAL SCIENCE

# Tiny H-Bombs Like TNT

"Bangless" H-bombs will probably make international control of nuclear weapons impossible, since nations can hide their progress.

► "BANGLESS" H-BOMB tests, discussed by Foreign Secretary Sir Anthony Eden in the British Commons, seems to confirm speculation over several years that it may be possible to trigger or ignite a hydrogen or fusion bomb without exploding an A or fission bomb as a starting mechanism.

The original idea was that the extremely high heat of a uranium or plutonium bomb was necessary to trigger the H-bomb. Now some other devices, such as wires exploded by a jolt of high voltage electricity, may do the trick.

If this is the case, one might make a little H-bomb, much smaller than any A-bomb. The miniature H-bomb might be set off with no more excitement than a charge of TNT.

The fission bomb (of uranium 235 or plutonium) must have a minimum mass, probably about 50 pounds or so, in order to set itself off by an uncontrolled chain reaction.

The light elements of the H-bomb, probably deuterium, tritium or even lithium, possibly could be set going by high temperature. It would be limited in its explosion by the amount of fusionable material provided and this might be very little. It might be so little that it could be referred to as a H-bomb trigger test.

In another sense, it could be said that explosions are no longer necessary to H-

bomb tests because the great secret is out. This is that the H-bomb can be exploded.

The greatest atomic secret was given the world when A-bombs were dropped in 1945 on Hiroshima and Nagasaki. Until a few weeks earlier when the first test at Alamogordo was successful, the scientists were not sure that their theory was correct. Similarly, the H-bomb explosions by the United States and Russia validated the theories of atomic fusion.

Now actual explosions can be foregone while scientists confident of their theory push ahead with developments and H-bomb production on both sides of the Iron Curtain. Great bangs that dirty the planet's atmosphere with radioactive debris, signaling atomic advances, may be used sparingly, hiding progress to competitive nations. Explosions have always been mere climaxes to atomic progress.

In the progress that seems apparent, the possibility of international control of atomic weapons through inspection seems to have faded completely. For the ingredients of the new bombs are too plentiful, too widely spread on the surface of the earth.

Little nations as well as big might be able to process them. Many more than three nations may hold the power of human murder in the future. The idea of no need for explosions may indeed be ominous.

Science News Letter, March 26, 1955



**MISSILE WITH BRAIN** — Size of the Falcon is compared to Air Force man. The deadly missile is six feet long and weighs 100 pounds.

## AERONAUTICS

## Six-Foot Air-to-Air Missile Has "Brain"

See Front Cover

► THE AIR Force has unveiled its newest guided missile, the Falcon, described as the "only air-to-air missile with a 'brain' of its own."

The trail of the projectile as it hunts down a drone is shown on the front cover of this week's SCIENCE NEWS LETTER.

The six-foot-long, 100-pound missile was designed to knock down enemy bombers carrying nuclear bombs before they reach the target. Falcons would be launched from jet fighters and once the target has been chosen the missile's electronic brain would control the course.

Built by Hughes Aircraft Co., the missile is expected to become a part of the regular armament of some Air Force interceptor units. The company said the Falcon's motors pack a thrust greater than some fighter jets and that tests indicate "every hit would be a kill."

The supersonic device has a range of from three to five miles and is launched automatically from the fighter. If the enemy bomber tries to maneuver out of the way, the missile will change course and follow it.

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Farmers today produce 38% more products on about the same amount of land farmed just before World War II.

Most of Asia's population, some 800,000,000 persons, derive about two-thirds of their daily calories from rice, mostly white rice.

## TECHNOLOGY

# May Can Fresh Milk

► HOUSEWIVES MAY soon be buying canned fresh milk that has been on the grocery shelf for weeks.

Bacteria-free whole milk, whose nutritional properties and flavor have not been changed, has been produced at the Illinois Institute of Technology in Chicago, it was reported by Dr. Harry E. Gunning, associate professor of chemistry.

Using mercury-in-gas resonance radiation, the Institute scientists have been able to reduce the bacterial count of whole raw milks to practically zero. In order to can or store whole milk, Dr. Gunning pointed out, it is necessary to kill the bacteria before they breed and turn the milk sour.

Although some flavor changes were found, in some of the experiments side-effects were practically eliminated.

The problems of flavor change and high costs have long plagued the experimenters who are trying to irradiate food for long-time freshness. Flavor changes in milk, for

example, are produced when either ultraviolet light, atomic radiation, cathode ray machines or X-ray machines are used.

By using the simpler mercury-in-gas resonance radiation, which Dr. Gunning described as superior to ultraviolet sterilization, the flavor alterations are markedly reduced and the high costs cut. The only barrier needed to protect workers against the resonance radiation is plate glass.

Discovery that off-flavors caused by resonance could be eliminated by the proper pre-treatment of the milk was made by Prof. Milton E. Parker, director of the Institute's food technology department. In experiments with the mercury-in-gas radiation, the scientists killed 3,000,000,000 bacteria per cubic centimeter of milk.

"Storage of milk without changing flavor or quality," Dr. Gunning said, "could revolutionize marketing of milk to the armed forces, housewives and other consumers."

Science News Letter, March 26, 1955