

NUCLEAR PHYSICS

H-Bomb Is Russian Asset

An H-bomb attack could wipe out most U. S. cities, but it would have less effect on Russia's less centralized population. Moscow would be the only Russian target.

► IN case of H-bomb attacks on the U. S. we shall have to write off most of the big cities in the country. This is the opinion of Dr. Ralph E. Lapp, who worked on the atom bomb during the war and who since has headed the Nuclear Physics Branch of the Office of Naval Research.

"Horrible as it may sound," he said, "we must be prepared to lose 10 to 15,000,000 people in the first day of the superblitz."

Because of the many American cities with large concentrations of population in contrast to the very few large centers of population in Russia, Dr. Lapp thinks that the H-bomb will be much more dangerous to us than to the Soviet Union.

An H-bomb is likely to produce a one-million ton equivalent TNT explosion, Dr. Lapp figures. "If we look in Russia for targets compatible with a one-million ton explosion we find that only one city qualifies. That is Moscow."

On all other Russian targets, Dr. Lapp said, "it might be more feasible to use the explosive force of an improved A-bomb."

"Even a casual inspection of American cities," Dr. Lapp pointed out, "reveals that we have far more compatible targets than Russia. In a certain sense we are rather like the man who lives in a tar paper shack and develops a flame thrower to protect himself."

Dr. Lapp noted that close to 20,000,000 people live in New York, Chicago, Philadelphia, Detroit and Los Angeles. "There is very little we can do about those cities, except to stop them from getting any worse."

As for Washington, Dr. Lapp declared that "no one will ever be able to convince industry that it should disperse or civilians that they should limit the size of the cities, if nothing is done about the overcentralization of government agencies."

He recommended as a first step that the Navy move out of Washington and that many branches of the Army and Air Force move out of the Pentagon. "The Pentagon should be drastically cleaned out. The space can be used for dead records."

"Most importantly," he went on, "we must avoid the concentration of key individuals in one locality. For example, I would think it entirely proper that the Senate meet in Alexandria, Va., and the House in Bethesda, Md."

Calling for more information on the government's atomic policies, Dr. Lapp said, "What we need now is a prospectus on

the H-bomb. With the simple facts about H-bomb effects, we can proceed to see how the use of the H-bomb against us forces us to modify our civilian life."

Dr. Lapp figures that an H-bomb will weigh about 25 tons and, consequently, will be extremely hard to deliver over the target. When it gets there, however, "certainly the detonation of such a superbomb would

be an awesome spectacle. The H-explosion would form a miniature sun glowing brilliantly in a searing flash of heat. At the moment of explosion there would be a flash of very penetrating nuclear radiation, but this would die out quickly and there would be little prolonged radioactivity."

Figuring that the strength of the explosion would equal one million tons of TNT, Dr. Lapp said that 100 square miles would be damaged and the area seared by the heat rays would range from 200 to 400 square miles.

"The heat effect from the H-bomb will be the most enhanced property of the weapon," he declared. He expects that the bomb will be exploded from a height of four miles above ground zero.

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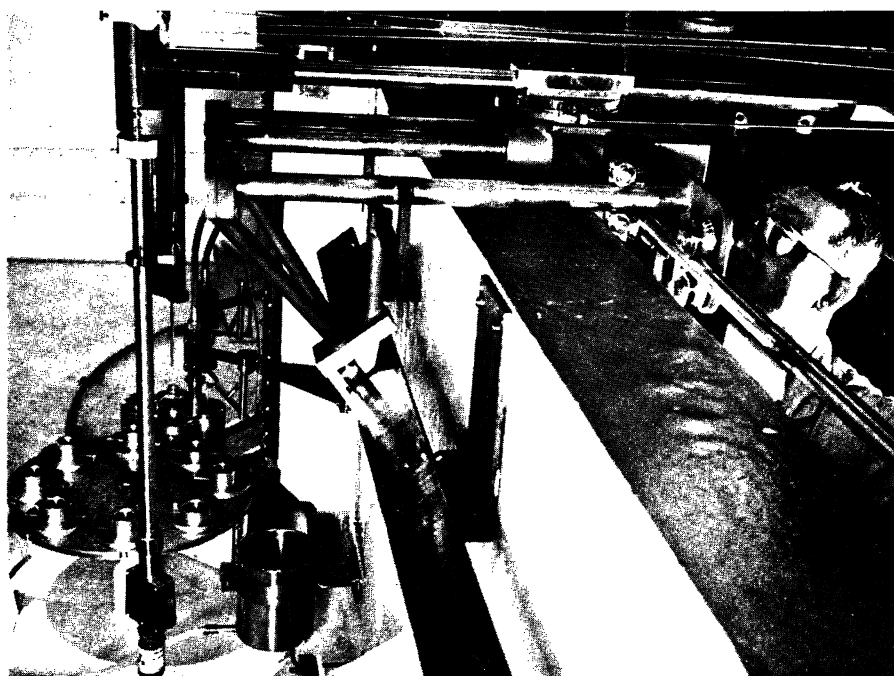
NUCLEAR PHYSICS

Improve Isotope Shipping

► MORE than 700 research projects using radioisotopes to promote health and cut industrial waste in the United States and 21 other countries are expected to profit from improved isotope shipping facilities just opened at the Oak Ridge National Laboratory.

New buildings where dangerously radioactive fission products from the atomic

pile can be stored behind adequate shielding walls and handled with production-line methods by remote control have been put into service by the Carbide and Carbon Chemicals Division of the Union Carbide and Carbon Corporation, operating the plant for Atomic Energy Commission. At the same time the Commission announced



HANDLED WITH CARE—Remotely controlled complex equipment is used in handling radioisotopes for shipment from Oak Ridge National Laboratory. The packing tongs shown are transferring a shipping bottle from the area of bottle-decapping, pipetting and sealing toward the barricade section (not shown) where the shipment is measured for radiation level and deposited inside the shipping container.

that the prices of isotopes which result from uranium fission will be reduced after March 1, and that these radioactive materials will be available in increased quantities.

Mirrors and periscopes in the new packing area allow the men who handle radioactive fission products to see the bottles they pick up. They work with long-distance tongs manipulated by means of levers and steering wheels. With these a measured quantity of radioactive liquid can be taken out of a stock bottle and transferred to the bottle in which it is to be shipped. Caps can be screwed back on the bottles, the measuring pipette washed, the stock bottle returned to its numbered place and the smaller bottle placed in its shielded shipping container, all by a man separated from the glassware he is handling by a two-foot-thick concrete wall.

Priced according to its rating in milluries of radioactivity, a radioisotope is shipped usually in hydrochloric acid solution, looking like a small medicine bottle full of water. No hint of the powerful rays emanating from this harmless-looking solution reaches the senses, but Geiger counters and other detecting apparatus, mostly of Oak Ridge manufacture, monitor every outgoing package. Packing material to shut out radiation, and also to soak up the liquid in case the glass should break, surrounds the bottle if the contents are not too dangerous. The whole package is then canned in a commercial tin can of the size often used for tomato juice.

More violently radioactive materials require foot-thick walls of lead to prevent their dangerous rays from leaking through. A few hundredths of a gram of active material may have a shipping weight of many pounds by the time its protective containers are assembled.

Research on cancer is carried on by means of two especially important isotopes from the Oak Ridge atomic pile. Iodine 131, which concentrates in the thyroid

gland, and phosphorus 32, which is picked up by bone marrow and other specialized tissues, are in the greatest demand by research groups. Phosphorus 32 has a long life and may be stockpiled for a considerable time, but isotope production at the atomic pile is geared to the short half-life of the iodine isotope. Taken from the reactor on Monday, it is stored long enough for accompanying unwanted radiation to die away, then packaged, and on Friday of each week loaded on the plane for delivery to research centers where it will take up its experimental role the following week.

Science News Letter, February 25, 1950

MEDICINE

Hamster May Be Weapon In Attack on Kidney Tumor

➤ HOPE for a better attack on a deadly kidney tumor that kills many children comes from a discovery reported by Drs. Hadley Kirkman and R. L. Bacon of Stanford University.

This tumor is known as Wilms tumor. The Stanford scientists have been able to produce tumors that may be the same as Wilms tumors in male hamsters. If the hamster tumors are the same, it will give scientists laboratory material for experiments on the cause and possible prevention or remedy for such tumors in children.

The kidney tumors in the hamsters were produced by injections of female sex hormone, diethylstilbestrol, in large doses over about half the life-time of the guinea-pig-like animals. This is believed the first time a kidney tumor has been produced by the use of sex hormones. The scientists point out that this hormone does not produce tumors in other kinds of laboratory animals and is in fact used successfully as a weapon against cancer of the prostate gland in men.

Science News Letter, February 25, 1950

RADIO

Saturday, March 4, 3:15-3:30 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Earl J. McGrath, Commissioner of Education, Office of Education, Federal Security Agency, will talk on "Science in Education." The young scientists attending the Science Talent Institute will ask questions of Commissioner McGrath.

By mixing powdered casein from milk with water glass, sodium silicate, a strong adhesive may be formed.

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