PUBLIC HEALTH

Study Fallout Patterns

Study of fallout and atmospheric patterns indicate that the radioactive fallout from a nuclear war would probably be strongest in the Northern Hemisphere.

See Front Cover

SHOULD a nuclear war occur between the United States and the Soviet Union, all of the radioactive fallout would rain down north of the equator within three to five years, a Congressional committee was told.

Assuming all the bombs were exploded over the U.S. and Russia, the Southern Hemisphere would escape the fallout hazards posed by strontium-90 and cesium-137.

The same would not be true for radioactive carbon-14, Dr. Lester Machta of the U.S. Weather Bureau told a special radiation subcommittee of the Joint Committee on Atomic Energy.

Some years after the attack, he said, carbon-14 would spread to the Southern Hemisphere.

The possible biological effects of the nuclear's war aftermath was considered at a week-long hearing, June 22-26.

Most of the hearing concerned the results of a hypothetical attack and retaliation taking place last Oct. 17. In this one-day mock war, the U.S. and Russia traded nuclear blows totaling about 4,000 megatons. Nuclear weapons are rated in megatons, one megaton being the equivalent of the blasting power of a million tons of T.N.T.

Dr. Machta said no matter where in the Northern Hemisphere the bombs were dropped, the fallout pattern would be much the same. It would concentrate at 45 degrees north latitude (including roughly Bangor, Me., Buffalo, N.Y., Detroit, Mich., Minneapolis, Minn., and Portland, Ore.) and taper off toward the equator and north pole.

Of all the radiation produced by the attack he said, 80% would be deposited quickly as local fallout, 15% would rise to the stratosphere (above seven miles) and 5% to the troposphere (below seven miles).

Most of the radioactive materials would be brought down by rain and snow. Most of the tropospheric material would fall out within a month and the stratospheric radioactivity would come down most likely within three to five years, Dr. Machta added.

In the photograph on the cover of this week's SCIENCE NEWS LETTER, the radioactive fallout pattern over the United States at seven hours is shown after the nuclear bomb explosion. The lighter areas of the "arrows" represents a dose rate greater than 300 roentgens per hour, while the darkest areas represent rates of between one and ten roentgens per hour.

IT WILL BE "hotter" in the shade of the old apple tree than out in an open space when the fallout from an atomic blast drifts down, a civil defense investigator testified in Washington.

It would be very unwise to duck under a tree for shelter from fallout, Myron B. Hawkins of the Civil Defense Research Project at the University of California, Richmond, Calif., told SCIENCE SERVICE. Mr. Hawkins testified at a Congressional hearing on atomic energy.

The average person would be better off staying in a basement or digging a foxhole, he added. Trees act as collectors of large fallout particles. As the particles meet and join together on the leaves they become heavy and drop to the ground beneath the trees.

For instance, on the West Coast you often see rain dropping only from tree leaves. This is because the fog particles float just above the surface of the earth. When the particles get caught on the leaves of trees they join together, become heavy and roll off, leaving the impression that it is raining under the trees.

Meanwhile, the remaining fog particles, because they have nothing upon which to condense, continue to float and are often carried away by winds. The same thing can happen with fallout particles, Mr. Hawkins said.

Nature would be a prime mover of fallout across the country. Wind, rain and water flow are the basic natural shufflers.

Rain could wash fallout from buildings and pavements into streams that empty into storm sewers, he reported. However, those particles that are deposited in flat areas such as farms would probably not seep into the depths of the earth because they would tend to become caught in the roots of the plants growing on the soil.

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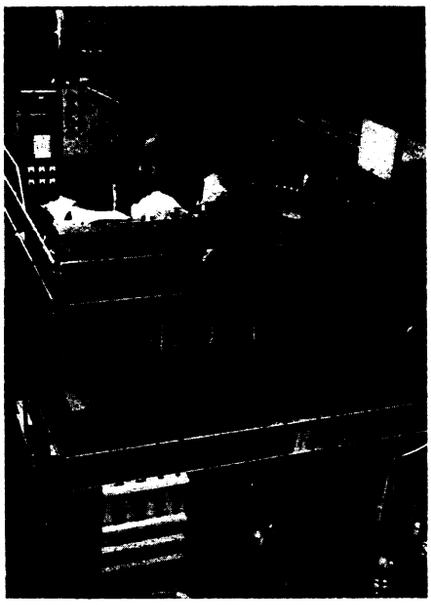

BUBBLE CHAMBER—The giant 72-inch "bubble chamber" in the University of California's Ernest O. Lawrence Radiation Laboratory, which is filled with liquid hydrogen, is used in studies of high energy nuclear particles generated by the Bevatron. The whole instrument weighs some 200 tons, and can "walk" by means of hydraulic "feet." The work with the instrument is a part of the fundamental research program of the laboratory sponsored by the Atomic Energy Commission.

GENERAL SCIENCE

NSF Reports on Scientists, Engineers in Industry

CLOSE TO three-quarters of a million scientists and engineers are working in industry, the National Science Foundation has reported.

However, only one-third of these 738,000 persons were engaged in research and development activities as of January, 1957.

From 1954 to 1957, employment of scientists and engineers increased by about 30% with employment in life sciences and physics increasing the most, by about 60%. At the same time, there was an increase of 80% in research and development costs.

Engineers made up the largest occupational group: 528,000. Among the scientists, the chemists were most numerous, 72,000. Other scientists are ranked as follows: life scientists, 16,600; earth scientists, 14,200; mathematicians, 12,400; physicists, 12,100, and metallurgists, 10,800.

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PHYSICS

Large "Bubble Chamber" Operates Successfully

THE WORLD'S largest known "bubble chamber" for detecting nuclear particles is now in successful operation at the University of California's Ernest O. Lawrence Radiation Laboratory at Berkeley.

The detector is six feet long, holds 150 gallons of liquid hydrogen. It looks like a bathtub and is about the same size. The California bubble chamber is part of a system that ties together the atom-smashing Bevatron, automatic scanning devices that borrow the principles of astronomical measuring engines, and high speed computers.

The system permits a deeper penetration of the mysteries of the atomic nucleus than previously possible, because the information to be studied is available in great quantity and covering a longer period of time.

In the bubble chamber, nuclear particles leave tracks of tiny bubbles that can be photographed for study and measurement.

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