

## PUBLIC SAFETY

# Fall-Out A-Danger

Physicist says foxhole covered by board and newspaper gives "surprising protection" from invisible radiation that "rains" on earth's surface after nuclear explosion.

► THE GREATEST peril from a nuclear attack is the unseen mist of radioactive particles contaminating the air, not the immediate blast-heat-radiation effects of the explosion.

Simple foxhole shelters provide "surprising protection" from this invisible radioactivity, Dr. Ralph E. Lapp, consulting physicist of Washington, D. C., reported in the *Bulletin of the Atomic Scientists* (Feb.).

A foxhole scooped out of the ground, with a coat or newspaper thrown over a board for an umbrella, can cut radiation exposure for the occupant to less than five percent of what he would get standing in the open, Dr. Lapp calculated.

The Government should construct "an extensive system of survival shelters" eight miles or more from the center of every large city immediately, he urged. Simple, level-with-the-surface concrete shelters with additional earth shielding provide real protection, and can be built on school playgrounds, in between divided highways, on park property and on golf courses.

Total investment for this "mandatory" protection from fall-out, Dr. Lapp believes, need not exceed \$2,000,000,000.

Fundamental rule of survival in case of nuclear attack is "get below the surface of the earth." A person with his head below ground has ducked out of the "illumination" of radioactive rays from surrounding areas, thus greatly cutting down his dosage.

The maximum peril from fall-out is concentrated in the first day or in the most heavily contaminated area in the first two days, Dr. Lapp stated.

An H-bomb of the type tested on March 1, 1954, could make an area the size of Maryland, about 10,000 square miles, so radioactive that an exposed person would receive twice the deadly dose in the first day. From the end of the first day to the first week, a person remaining in the area would receive a lethal or near-lethal dose.

The danger would last for weeks following the explosion, thus preventing use of the region by humans.

Many metropolitan areas, Dr. Lapp concluded, "will become a kind of no-man's land should they become heavily contaminated." A city smashed into rubble would be almost impossible to decontaminate, and the "wisest thing to do with the central city would be to level it with demolition charges and bulldozers and cover it with earth, converting it into a huge metropolitan park."

Lakes instead of parks might be created in low-lying areas, such as Detroit, Chicago and Baltimore.

An attack, which Dr. Lapp described as

"small-scale," consisting of 28 superbombs, 18 dropped over major industrial cities east of the Mississippi and 10 exploded so as to blanket dense metropolitan areas with radioactive dust, would "atomize" an area normally occupied by 50,000,000 Americans. Over two-thirds of U. S. industrial production is centered in the same area.

Radioactive fall-out is the "third quantum jump" in the history of modern weapons. The first quantum jump, Dr. Lapp explained, was the A-bomb that shattered Hiroshima, destroying an area of about seven square miles. The second jump was the much more powerful bomb that spread its blast-heat punch over 300 square miles on Nov. 1, 1952.

The third jump — to lethal radioactive fall-out — is still too recent to be fully understood. But it calls for, at minimum, these actions, according to Dr. Lapp:

1. Dispersal of city populations to sites where they will not be crushed and burned.
2. Construction of a ring of simple shelters on the outskirts of large cities.
3. Dispersal of new industrial plants.
4. Equipping plants to shelter the work force for one week.
5. Special shelter rooms built in the basement of all new homes outside the city.

Although both the policies of evacuation and dispersion are still valid, Dr. Lapp concluded, they have to be coupled to a realistic shelter program. But the most important point is to educate the public on the facts of survival in the age of the "invisible killer," radioactive fall-out.

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## TECHNOLOGY

## Machines Shown That Can Outwit Man

► TWO SMALL electronic calculators that can outwit a man were shown at a meeting of the American Institute of Electrical Engineers in New York.

"Little Audrey" is a computer about as big as a large television set. She can distinguish three spoken words: yes, no and okay. With this repertoire she is ready to pit her circuits against the human brain.

"Pick a number," she challenges by flashing a card with the words on her screen. The person who accepts must then perform a series of calculations ordered by "Little Audrey," using the number he picked. He must also answer a few of the machine's questions by "yes" or "no."

Of course, she always guesses the number except when the person who accepts the

challenge says "yeah" instead of "yes." This confuses the device because it is the "s" sound in "yes" by which the machine distinguishes the word.

The second machine is an electronic "brain" that specializes in psychology.

A person sits before the Outguesser and signals "heads" or "tails" in any order he wishes. The device then attempts to anticipate which he is going to call out next. Computers inside the machine analyze each call and try to find out the person's strategy. The machine almost always wins.

The devices were shown by G. R. Frost and D. W. Hagelbarger of Bell Telephone Laboratories.

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