

PUBLIC HEALTH

Latest Fallout Report

Atomic Energy Commission releases figures on radioactive fallout, including gamma dosage for the first time. Counts are monitored by 88-station, world-wide network.

► THE UNITED STATES has received a larger average dose of gamma radiation as a result of atomic and hydrogen bomb tests than has the rest of the world.

This is shown in the latest Atomic Energy Commission report on radioactive fallout in *Science* (Aug. 10).

The report, which gives the figures for radioactive fallout throughout the Western World through September, 1955, is the first official one to include the gamma dosage.

The gamma dose is included, Merrill Eisenbud and John H. Harley of the AEC's Health and Safety Laboratory in New York state, because geneticists use it as the basis for estimating the number of radiation-induced chromosome mutations in the population as a whole.

The atomic health experts point out that the average dose of gamma radiation between 1951 and 1955 has been about 10 millirads. This, they say, is small when compared to the gamma radiation the population receives from natural sources and cosmic rays, which is put at 300 millirads for the same time period.

The report's figures are based on the AEC's fallout-monitoring network that involves some 88 stations throughout the world, including 26 in the United States. Aim of the network is to estimate the levels of human exposure produced by radioactive fallout at great distances from nuclear detonations.

Data include the cumulative surface deposits of mixed fission products and strontium-90, which often ends up in human bones, and the cumulative gamma dose.

The report shows that the highest recorded accumulation of mixed fission products was at Grand Junction, Colo., with 740 millicuries recorded per square mile. The lowest was recorded at Lagos, Nigeria, with 33 millicuries per square mile.

Estimates of strontium-90 ranged in the United States from 2.1 millicuries per square mile at San Francisco to 23 at Salt Lake City. Estimates of the average gamma dosage show that the range of values in this country are relatively narrow, 6 to 49 millirads, except for Salt Lake City, which recorded 160 millirads; Grand Junction, which recorded 120, and Albuquerque, N. M., which recorded 110.

The representative dose for eastern United States is about 15 to 20 millirads, with slightly higher values in the Middle West and lower values on the West Coast.

The report also points out that weathering and shielding play an important part in estimates of radioactive fallout. For people in cities, for example, "the true dose is very much reduced by the fact

that fallout to the surface is soon washed into gutters and sewers. For these reasons, it is likely that the actual dose to urban populations does not exceed 10% of the values reported."

The significance of the findings, scientists Eisenbud and Harley state, are these:

1. The gamma dose delivered from fallout to date is only three percent of the average gamma dose from natural sources. Thus, even the maximum theoretical dose from fallout is a small fraction added to natural radioactivity, and has a greatly reduced effect when compared to the natural variations that occur from time to time.

2. Strontium-90 is absorbed by humans, plants and animals. Its measurements in foodstuffs can now be taken by scientists. Thus, a study of milk in the United States made early this year showed it contained only 1/350th the amount of strontium-90 that would be needed to make the milk harmful to drink.

The report concludes on this note, "according to the National Academy of Sciences, 'already some children have accumulated a measurable amount of radioactive strontium in their bodies. The amount, however, is quite small—a thousandth of what is considered a permissible dose.'"

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METEOROLOGY

Hurricane-Steering Winds

► THE DIFFICULTY in forecasting the paths of hurricanes more than a few hours in advance is that they are steered by high-altitude winds.

Only the general wave-like patterns of these planet-wide, upper atmosphere wind belts are known.

Embedded in this world-circling stream is a continuous parade of whirls or eddies. It is these large cyclones and anti-cyclones that guide the hurricanes. They are at least hundreds, and more often thousands, of miles across, compared to the 200- to 300-mile diameter of tropical storms.

Because movements of these high-altitude "highs" and "lows" are difficult to forecast, so also are the tracks hurricanes will take.

Learning how to predict hurricane paths more accurately is the aim of an all-out attack initiated this year under the direction of the U. S. Weather Bureau.

The assault on nature's most destructive storms is two-pronged, being on both operational and research levels. Cooperating closely are the Joint Hurricane Warning

ENGINEERING

Scientists Study Brick Masonry

► BRICK MASONRY, one of the oldest construction methods in use today is being studied with a variety of up-to-the minute devices.

In the engineering department of the University of California at Los Angeles, masonry testing equipment includes an ultrasonic device for testing masonry walls, instruments to probe the bond between mortar and brick, building models crumbled by man-made earthquakes and a machine that tears brick walls apart.

The sonic device sends tiny tremors through brick walls. These are reflected back and recorded on an oscilloscope. Characteristic patterns on the scope may reveal unsuspected cracks and other defects. Present masonry tests involve the expensive process of cutting sample cores out of walls and are not entirely satisfactory.

Although brick masonry has been in use for thousands of years, no one yet knows the mechanism of the bond between brick and mortar. Determination of this mechanism may help set new standards for masonry work.

Plastic models of brick buildings are being crushed in a manner simulating earthquakes to find out how masonry fails under these conditions.

Full-scale masonry walls are being torn apart to learn the nature of stresses that act parallel to the way the brick is laid.

The study, which is under the direction of J. Morley English, is being supported by the California State Division of Architecture.

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Center in Miami, manned by the U. S. Weather Bureau, Navy and Air Force Weather Service, and the National Hurricane Research Project, under the direction of Robert Simpson, long-time Weather Bureau expert on tropical storms.

The weapons marshaled this year to learn more about hurricanes range from electronic computers to scientists with pencil and paper, from three especially equipped hurricane-hunting research airplanes, in addition to the regular military squadrons, to a network of radar stations.

Present forecasts of hurricane paths are good no more than 36 hours in advance, but the swirling storms are so unpredictable in their courses that even these short-term predictions are not as accurate as weathermen would like, although they do save lives and reduce property damage.

Meteorologists aim not only to improve the accuracy and increase the time range of forecasts, but also to predict where and when the storms form.

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