

PHYSICS

Fallout Hazard to Grow

The average content of strontium-90 in man is steadily increasing, and the averages for man on the five continents studied are strikingly similar.

► THE AMOUNT of cancer-causing strontium-90 in the bones of man will be 10 to 20 times greater by 1970 than it is today. But even with this increase, it will be far below the amount of the radioactive by-product of hydrogen and atomic explosions now considered to be the maximum permissible concentration for man.

This is the conclusion of the most comprehensive study of radioactive fallout and strontium-90 in man ever reported to the public. Based on the study of five continents, the report was written by Drs. J. Laurence Kulp, Arthur R. Schulert and Walter R. Eckelmann of the Lamont Geological Observatory, Columbia University, Palisades, N. Y., and published in the journal *Science* (Feb. 8).

Everytime an H- or A-bomb is set off in the world, debris made radioactive, and including strontium-90, is sucked up and dispersed in the air currents. Some of it falls back to earth very quickly. Much, however, depending on the size of the bomb and the type of detonation, is carried along in the stratosphere for years, gradually washing down on earth with rainfall.

The radioactive strontium-90 that falls on the earth has first an affinity for calcium in the earth's upper crust and secondly for calcium in man's bones. Plants take up the strontium-90, as well as cows eating the plants, and after a while, it is taken into the human body along with dinner and finds its way to bones, where it can cause cancer if in large enough amounts.

The problem studied by the Columbia scientists under a grant from the Atomic Energy Commission was to try and find out how much strontium-90 there is in humans throughout the world and what potential hazard it holds for mankind.

A careful analysis of bones of humans gathered from 12 countries led the research team to draw the following conclusions:

1. The present world-wide average content of strontium-90 in man is about 0.12 micromicrocuries per gram of calcium, or 1/10,000th of the presently accepted maximum permissible concentration.

2. The averages for the different continents are surprisingly similar, indicating that already the stratospheric drip of strontium-90 from megaton explosions is swamping the local concentrations from both the Nevada and Soviet test sites. (There is evidence, however, the report states, that Chile and Brazil have clearly lower concentrations than those localities in the Northern Hemisphere for which good sampling is available. Houston, Texas, and Bonn, Germany, were found to have similar concentrations.)

3. There is clearly an age effect, at least in the first 20 years. Young children have three to four times more strontium-90 per gram of calcium, on the average, than adults. This effect reflects the larger proportion of active bone in children.

4. As was expected, the average strontium-90 content of human bone does not vary from one locality to another more than the average concentration of mixed fission products.

5. An average of all samples from persons above 10 years of age showed that the concentration in Vancouver, B. C., was about the same as Houston, whereas the concentration in Denver is definitely lower.

6. There are large deviations from the mean in the strontium-90 content in individuals of a given locality. The average deviation for most 10-year-olds is about 50%. Some individuals in the United States may have at least 10 times the average concentration, which is thought to be related to diet.

The three scientists estimate that from ex-

plosions that have already occurred, the average human bone in the United States should contain about two micromicrocuries of strontium-90 per gram of calcium by 1970.

The world-wide average concentration will be lower, they predict, about 1.3. These figures are based on the fact that 50 megatons of fission have now been set off.

It would take 700 times this amount, or 35,000 megatons of fission released on the world, to bring the average concentration up to the maximum permissible concentration.

The most important problem, the scientists say, is the individual variation which must take into consideration the food sources in the diet.

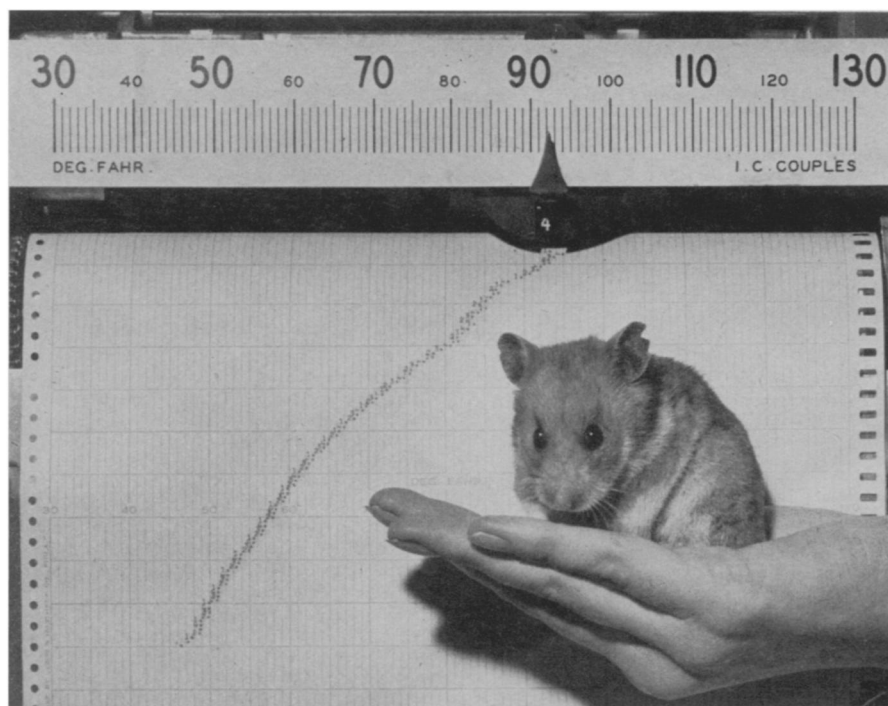
At present, the scientists conclude, the world-wide average strontium-90 of man is 1/10,000th of that considered safe for his well-being.

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● RADIO

Saturday, March 2, 1957, 1:45-2:00 p.m., EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Eugene McDonald, director of Speech and Hearing Clinic, Pennsylvania State University, State College, Pa., and Dr. Harold Westlake, director of Speech and Hearing Clinic, Northwestern University, Evanston, Ill., will discuss "Speech Defects and Remedies."



HAMSTER AWAKES—Dr. Charles P. Lyman of Harvard University, who is studying the body mechanisms of hibernation, has been inducing hibernation and waking in a room where temperatures can be lowered to freezing or raised to the warmth of a summer's day. Although the hamster usually hibernates all winter, he rouses himself, winter or summer, when the temperature in his experimental room goes up.