

The PHS insists that at current levels of fallout in the United States there is no danger in maintaining present eating habits. However, the expected increase in fallout next spring from the Soviet bomb tests certainly warrants some revision in diet, particularly for children, so that foods with lower levels of strontium-90 are predominant.

The amount of fallout in some foods had been steadily increasing even before the recent Russian tests, the 1960 AEC annual report stated. A PHS spokesman pointed out that as atomic energy becomes more widely used as a source of power, "fallout" from these sources will add substantially to the burden of contamination in foods.

Government scientists are trying to find a way to keep atomic dangers at a minimum consistent with good health and safety. Meanwhile, however, thorough washing of all foods, peeling vegetables, boning meat before cooking, and being more selective in diet are the only remedies that can be exercised by the public.

As part of its monitoring program, the AEC is conducting a tri-city study of strontium-90 in average daily diets. The cities under study by the AEC are San Francisco, Chicago and New York. Selected foods representing the total average annual consumption of an individual, were purchased in each of these cities at three-month intervals and then analyzed for strontium-90 and stable calcium to determine the strontium to calcium ratio. The studies show that radiation levels are highest in New York and lowest in San Francisco, confirming that the rate of fallout is greater in the northeastern part of the United States. The total amount of strontium-90 intake estimated on an annual basis is three times higher in New York than in San Francisco.

The strontium-90 to calcium ratio of an average New York diet in 1959 was 17 strontium units. The Federal Radiation Council has set .5 rem as the annual maximum permissible limit of radiation exposure from all non-medical man-made sources for the general population. According to FRC estimates, the body discriminates against strontium-90 by a factor of four. This would mean an "average" annual exposure, measured in rems, of a little over .01. Actual uptake depends on the body's calcium control.

While this would be well within the limits, it must be remembered that strontium-90 is only one of many elements of man-made radiation. It is possible that the total present dosage in certain areas and for some individuals exceeds the .5 rem limit. Also, the "averages" as estimated by the Federal Radiation Council are not scientifically realistic estimates. At best they may be termed scientific "guesstimates," since there is nothing average about fallout, either in its distribution or its uptake by earth, plants or man.

Although the U.S. Government recognizes the dangers of radiation, there has been little or no evident planning here to handle a situation if wheat or milk, for example, reached dangerous high contamination levels from bomb test fallout.

Great Britain has set aside powdered milk

for such emergency use. This has not been done here, nor is such action contemplated, a PHS spokesman told Science Service. Yet if an emergency did occur it would take months to set up enough plants to remove strontium from milk. It has been suggested that storable staple surplus food commodities be set aside in the event of any local or national emergency resulting from excessive fallout. Stockpiling of all foods by canning or freezing could be done locally under Federal and state sponsorship, and a system of rationing developed. Meanwhile, it might be helpful to publish weekly estimates of radiation levels in foods so that the housewife could plan a diet that will not impose too great a risk from radiation. Canned and processed foods are now labeled for food additive contents. It should be possible to include estimated radiation levels.

While these and other projects have been discussed, no program has been decided upon. For the health of the nation, since a nuclear test ban now seems remote, a decision must be made soon.

Units for Measuring Radiation

curie—The radioactivity of one gram of radium is a curie.

micro microcurie or picocurie—One millionth of a millionth of a curie.

roentgen—A unit of radiation dose. Exposure to a wristwatch dial containing one millionth of a curie of radium, at a foot distance from the body, results in a body exposure of about 10 millionths of a roentgen per hour.

rem—(roentgen equivalent man), the radiation exposure dose for man which specifically expresses the radiation absorbed by human tissue.

strontium unit—(SU), one micro microcurie of strontium-90 per gram of calcium. According to the biology and medicine division of the Atomic Energy Commission, one SU is equal to 3 millirem or .003 rem. The equivalent in rem for any element varies with its energy absorption per gram of body tissue.

Radiation Protection Guides (RPG)—These are limits, measured in rems, set by the Federal Radiation Council, for certain body organs as well as for whole body exposures to ionizing radiation. They have been approved by the President.

RPG for General Population:

Thyroid—.5 rem per year
Bone marrow—.17 rem per year
Bone—.5 rem per year
Total body—.5 rem per year

Range limits set by FRC for daily intake of radionuclides in micro microcuries per day. Above limits for Range II, action is necessary to protect the public.

Radionuclide (affects)	Range I	Range II	Range III
Radium-226 (affects bone and marrow)	0-2	2-20	20-200
Iodine-131 (affects thyroid)	0-10	10-100	100-1000
Strontium-90 (affects bone and marrow)	0-20	20-200	200-2000
Strontium-89 (affects bone and marrow)	0-200	200-2000	2000-20,000

• Science News Letter, 81:26 January 13, 1962

GENERAL SCIENCE

Science Integrated Into Society Since W.W. II

► THE SIGNIFICANT integration of science into society in the years since World War II was discussed by Dr. Glenn T. Seaborg, Nobelist and chairman of the Atomic Energy Commission, who delivered the John Wesley Powell lecture of the American Association for the Advancement of Science at Denver, Colo.

"The entry of scientists," he said, "into important national advisory capacities is the inevitable concomitant of the events of the past twenty years. It does not seem to me that the influence of scientists in this respect is greater than it should be; indeed, in the national interest, it must increase."

The greatest problem of a democratic people adjusting to this new condition is that of assimilation and understanding of the new decisive role of science.

"In the past two decades, our democracy has ingested science, but has not digested it." Fundamental in this assimilation, Dr. Seaborg believes, is bridging the present gap between two hostile groups of individuals—the literary and the scientific. "The philosopher, the social scientist, the artist, the writer, the natural scientist, all are intellectual brothers under the skin." There must be a "working realization of the common heritage of truth-seekers—among scientists as well as other intellectuals."

Dr. Seaborg made it plain that he did not consider this "new kind of society as the property of science. We cannot proceed intelligently without integrating into our thinking and our acting the full range of human wisdom."

Most important in accelerating the process of assimilation of science is the expansion and raising of the level of education all along the line. "We must search out and cultivate the gifted and creative," he said. "We must mine every vein of our human resources."

Concerning the future, he asked "Can the democratic-scientific society combine the values of freedom and individual worth with the promise of growing material well-being, not only for ourselves but as a choice for other peoples?"

"I believe we can and will, partly because of the moral strength of freedom and partly because of material power of our new society."

• Science News Letter, 81:27 January 13, 1962

Stutterers as Orators

► STUTTERERS in their mind's eye see themselves as great orators, their drawings made as part of a remedial psychological study reveal.

Prof. Joseph A. Fitzpatrick of the University of Denver reported to the American Association for the Advancement of Science in Denver, Colo., that the image that stammerers and stutterers have of the "ideal speaker" is not any great orator, past or present, but of themselves projected into the role.

• Science News Letter, 81:27 January 13, 1962