PUBLIC HEALTH

Atomic Age Public Health

RADIATION HEALTH HAZARDS will be explored at the world's first Department of Radiological Science at Johns Hopkins University.

"The school will be concerned with all aspects of the radiation health picture; and its aim will be to train radiological health specialists and researchers for both national and international service," Dr. Russell Morgan, who will head the department, told SCIENCE SERVICE. A specialist in radiological medicine, Dr. Morgan is chairman of the National Advisory Committee on Radiation to the U. S. Public Health Service.

Dr. Morgan credits Dr. Milton Eisenhower, president of Johns Hopkins, for "pulling out all stops" to get the program started.

"He is extremely interested in this field of research and dedicated to the goal of producing graduates in public health qualified for the responsibility of guarding the health of the nation and, indeed, the world."

The department will operate within the Johns Hopkins School of Hygiene and Public Health, the first of its kind when it was set up nearly half a century ago. It has been the forerunner and model for 15 similar schools in North America and 20 others throughout the world.

Dr. Morgan predicted that the new plant and program also will serve as a model here and abroad. He labeled the health effects of radiation "the biggest biological problem of the atomic age and, perhaps, the greatest challenge to the field of public health."

Radiological science at the University will deal with the problem of food contamination from radiation, searching for new methods to remove this hazard. It also will concentrate on fundamental research "to better determine the extent and consequences of the reaction of radiation on the biological system and environment." Another area will deal with practical application of research studies in the field of public health.

Estimated costs of the new laboratory to be built, equipment and personnel are $2,000,000.

"We hope to keep the classes small for the best reason. . . . We are interested in turning out quality rather than quantity," Dr. Morgan said. "The technical nature of the problems involved as well as research to be explored requires that the students in this department have advanced knowledge in engineering, medicine, biophysics, and be in the top level scholastically."

The graduates will be the leaders in radiological health. "I foresee a sizable demand for these health specialists both here and in the underdeveloped countries where nuclear power will be needed," he declared. "The scope for their service is limitless."

• Science News Letter, 78:82 August 6, 1960

PUBLIC HEALTH

Low Jet Fallout Levels

RADIOACTIVE FALLOUT, regarded as a potential danger to the air traveler in the jet age, has been under continuous study by the U. S. Public Health Service for the past two years.

Fortunately for both jet flight enthusiasts and commercial jet airlines, the levels of fallout accumulating on jets in flight are low and present "no significant increases in the radiation exposure of the crew and passengers."

The special projects branch of the PHS division of radiological health reports that tests of air samples inside the jets during flight revealed that radiation in the aircraft's interior does not exceed that of normal background.

"As a matter of fact," a PHS official said, "the metal surfaces of the plane seem to provide passengers and crew inside with an effective shield from the areas of higher radiation through which the jet passes in flight."

Greatest exposure appears to be occupational, involving maintenance personnel working around the aircraft while it is on the ground after flight. However, even here the radiation exposure levels are sufficiently low to require no more than simple decontamination procedures.

Radioactive particles do not accumulate uniformly on the entire surface of the jets. The "hot spots," or areas of significant contamination, are those passing large volumes of air, such as the turbine blades, front frame and propeller blades, and regions where grease settles.

The contaminated surfaces are easily and safely cleaned with a solvent and then may be washed with a detergent and water. Levels of contamination are sufficiently low to permit decontamination crews to work without special protective clothing.

The PHS study followed research by the Atomic Energy Commission, the Air Force and the Federal Aviation Agency showing that the altitude levels of high-flying jets exposed them to greater amounts of radiation than the lower altitude levels of conventional aircraft.

This is because jets travel commonly in that part of the upper atmosphere or stratosphere where radioactive debris may remain from less than a year to several years. These findings have been substantiated more recently by the fallout pattern studies of the Lockheed U-2 airplanes of the type downed by the Russians on May 1.

Pan American World Airways jet planes were used by the Public Health Service for the survey and testing required by the study. PHS credits the medical department of PanAm with providing numerous and essential smear samples from the exterior surfaces of their jets as well as its own independent analyses, which were given to PHS.

Several other airlines in this country, following the lead of PanAm, now have offered the PHS similar service and cooperation on demand.

The PHS, with PanAm and other commercial and Government establishments, is continuing its contamination studies on jets in order to provide the public with full protection against any radiation hazards from jet flight that may develop in the future.

Public Health authorities expect no appreciable increase in radiation levels on jets unless there is a resumption of nuclear weapons' testing.

• Science News Letter, 78:82 August 6, 1960

MATHEMATICS

Formula Devised for Fallout in Buildings

A MATHEMATICAL METHOD for computing the levels of radioactive fallout inside buildings has been developed at the National Bureau of Standards.

The formula, with further refinement, will make better fallout shelter design possible.

Using a detector at the center of the structure, the formula calculates intensities within basements, the amount of radiation entering through windows, how much comes through roofing as distinguished from that coming through walls, and the barrier to radiation offered by flooring and inner partitions.

The method is the result of a study by Charles M. Eisenhauer and Dr. Lewis V. Spencer of the Bureau. They worked under the sponsorship of the Office of Civil and Defense Mobilization.

The Bureau expects the formula to shed new light on the behavior and effect of scattered radiation in shelters. Heretofore scattered radiation has been difficult to calculate, although it is known to vary with wall thickness.

The intensity, or dose rate, of fallout within a structure or building depends upon the thickness and density of the walls. The dose rate for direct radiation is now known.

With the formula, radiation emerging from thin walls can easily be computed by multiplying the formula's barrier factor by the geometry factor for the direct radiation. In estimating the intensity through thick walls, the barrier factor is multiplied by the geometry factor for scattered radiation.

A controlled experiment at the Army Chemical Warfare Laboratories using cobalt-60 sources around a concrete blockhouse, taking data at the center of the eight-foot-high structure at various heights from ground level to six feet above ground, has verified the trends determined by the new method of calculating interior fallout.

• Science News Letter, 78:82 August 6, 1960