

- 197 The Evaluation of Risks From Radiation. R.S. Russell.
Health Physics 12, 239 (Feb. 1966).

The imprecision of assessing risks from radiation permits only a definition of the range or "orders of risk" within which effects they may lie. For the somatic effects quantitative estimates of risk have been attempted only for the induction of cancer. "There is no clear evidence, from the human studies, that radiation in small doses will give rise to appreciable 'non-specific life shortening' or to other serious consequences to the exposed individual other than cancer." Radiation-induced leukemia will appear in about 20 persons per million during a period of 10 to 20 years after exposure to 1 rad. The total yield of all other fatal malignancies appears to be comparable to that of leukemia. Thyroid carcinoma appears to have a comparable incidence which is described as a fifth order risk (1×10^{-5} — 10×10^{-5} probability). The only comprehensive parameter available currently to assess the effects of radiation on future generations is "genetic death." The exposure of a parental generation of 1 million persons to 1 rad may cause approximately 2,000 genetic deaths during the next ten generations; this "fourth order of risk" corresponds to 0.1% of the natural incidence. A number of reasons are suggested why estimates of genetic death may represent the possible upper limit of the total genetic injury. The average annual occupational exposure of 0.5 rad per year represents a fifth order risk as compared to a fourth order risk of deaths due to other occupational injury, i.e., 100-200 deaths per million male workers in all occupations in England and Wales. -- J. Occ. Med. Absts.

- 198 Radiobiologic Aspects of the Supersonic Transport. A.C. Upton.
Health Physics 12, 209 (Feb. 1966).

The supersonic transport (SST) will fly at altitudes of 60,000-80,000 ft. At this upper altitude, the galactic cosmic radiation is estimated not to exceed 1-2 mREM/hr. Solar flare radiations, produced intermittently in outbursts associated with sunspots, may be expected to contribute on the average only a small fraction of the total exposure to occupants of the SST. On rare occasions, perhaps once or twice during an 11-year period, a major flare may deliver peak dose rates of as much as 1-10 REM/hr. at 80,000 ft. on polar flights with 0.5-5 REM or more in the first hour and decreasing amounts during the succeeding 12-48 hr. A warning system is necessary to direct the SST to descend to a lower altitude if necessary. If major solar flares are avoided, the cumulative exposures to the crew and passengers should be within permissible limits. -- J. Occ. Med. Absts.

ENVIRONMENTAL MEASUREMENTS

- 199 The Evaluation of Efficiency and Variability of Sampling for Atmospheric Nitrogen Dioxide.
F.L. Meadows and W.W. Stalker. Am. Ind. Hyg. Assn. J. 27, 559-566 (Nov.-Dec. 1966).

A study of the efficiency and variability of the sampling system used to collect nitrogen dioxide in the Alabama Air Pollution and Respiratory Disease Study is described. Experimental sampling was conducted with single and multiple bubblers in series, equipped in each case with either fritted-tip or restricted opening air dispersers. Comparative evaluations of 0.4 to 0.5 lpm and 0.2 to 0.3 lpm air-flow rates indicated that higher collection efficiency, but greater variability, can be expected with lower air-flow rates. Fritted-tip bubblers were found to be more efficient, but restricted-opening bubblers are preferable because their variability is about half that of the fritted-tip bubblers. Sampling variability apparently was not affected by ambient air temperatures, humidity, or the concentration of collecting solution used. Collection efficiency, variability, and the method of empirically determining these factors should be specified when reporting ambient atmospheric nitrogen dioxide. There are 13 references. -- Authors' abst.

PREVENTIVE ENGINEERING

- 200 Practical Designs for Noise Barriers Based on Lead. B. Fader.
Am. Ind. Hyg. Assn. J. 27, 520-525 (Nov.-Dec. 1966).

Acoustical theory predicts that sheet lead and soft plastic materials loaded with finely divided lead should be excellent sound barriers. Seven case histories are given to show how this "limp mass" has been applied in practical problems. -- Author's abst.

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