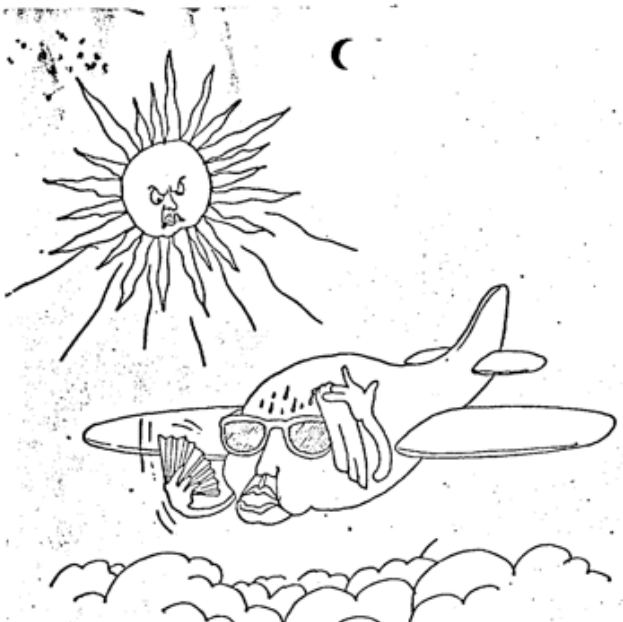

hour was meant and was actually used in obtaining his estimate of 0.480 rem per year for SST crew members, assumed exposed for 480 hours per year to radiation at SST altitudes. Note that the three-figure precision of this result is quite unwarranted. Schaefer believes that the 1 percent increase in risk of malignancies for crew members from such flight exposure as he calculates "is a very small increase indeed." SST crew members might not entirely agree with this assessment of their risk or with Schaefer's cavalier dismissal of their average life shortening of five days for each year of SST service. Of course, the loss of life for an individual who does develop a malignancy will generally be tremendously greater than the five-days-per-year average loss. Further, Schaefer's dose-altitude figures suggest that the radiation dose-rate may only be two or three times less on the average for ordinary jet travel than for SST travel. Thus, even present-day jet crew members seem likely to be exposed to radiation risks that many would not consider entirely negligible.

To a first approximation per mile traveled, the increased SST airspeed cancels the increased SST dose-rate compared to that at ordinary jet altitudes (see Schaefer's Figure 3). Thus, the dose received in a given trip over the same route is roughly the same whether ordinary jet or SST travel is considered. Now data from X-ray exposure of pregnant women (Stewart, A., and G. W. Kneale, *Lancet*, 1:1185-1187, June 6, 1970) indicate that the chance that an exposed fetus will develop cancer after birth is much greater if exposure occurs in the first trimester of pregnancy than if it occurs later in the pregnancy, or to a child or adult. This great sensitivity to ionizing radiation of embryos in early stages of their development suggests that to the degree that Schaefer's dose-rate data can be trusted, even a single transatlantic ordinary jet or SST round trip by a pregnant woman during this sensitive period may appreciably increase the risk of cancer to the developing child. Lederberg (*Bull. Atom. Sci.*, 28:6, June 1972) has well emphasized that radiation hazards should be examined with reference to the natural radiation background. A single such trip as that above would lead to a dose approximately equal to the natural sea-level dose accumulated in the first two months of pregnancy. Thus, such trips, and especially those which pass near the pole, where the galactic radiation level is highest, should evidently be avoided as much as possible by pregnant women, particularly those in their first trimester. □

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HEALTH

Air Pollution and Smoking

Theodor D. Sterling

In 1964 the Surgeon General's Advisory Committee on Smoking and Health, in its famous report, officially linked smoking to the subsequent occurrence of lung cancer and other lung disease. To those of us who had been involved in the study of the effects of air pollutants, this did not seem to matter a great deal. After all, there were no offhand reasons why lung cancer could not have many causes. However, in the enthusiasm of many of our colleagues in attacking cigarette smoking as the major public health problem, the effect of cigarette smoking has been increasingly contrasted with that of pollutants and industrial exposure until today a real question exists if cigarette smoking is not diverting attention from the effects of occupational exposure on industrial workers and of the increasing air pollution burden on the population of our communities.

The 1964 report of the Surgeon General's Advisory Committee on Smoking and Health immediately discounted air pollution as a major cause of lung cancer and chronic bronchopulmonary disease. Follow-up reports prepared by the National Clearinghouse for Smoking and Health and issued over the signature of the surgeon general have supported and expanded this position. These reports claim that, for the bulk of the population of the U.S., a large number of cancerous and noncancerous lung diseases are predominantly caused by smoking and that the effect of either air pollution or occupational exposure is minimal. Some relevant quotations are the following:

"Cigarette smoking is much more important than occupational exposures in the causation of lung cancer in the general population." And, "For the bulk of the population of the United States, the relative importance of cigarette smoking as a cause of chronic bronchopulmonary disease is much greater than atmospheric pollution or occupational exposures."[1]

Similar statements have been made in respect to chronic bronchopulmonary disease[2] and to lung cancer.[3]