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Cancer—Opportunism and Opportunity

When people are unable to evaluate the magnitude of risks in a situation, many are inclined to fear the worst. This has been especially true in attitudes toward the health hazards associated with chemicals. A tendency for some people to be "spooked" has been exploited by opportunists who have talked of a cancer epidemic allegedly created by chemicals. Some chemicals in the workplace are carcinogenic, but their contribution to cancer prevalence is small in comparison to that of smoking and probably to that of natural substances in raw and cooked foods.

Talk of a cancer epidemic seems to owe much to misinterpretation of a statement made by John Higginson of the International Agency for Research on Cancer. He has written, "between 80 and 90 percent of all cancers are dependent directly or indirectly on environmental factors." However, Higginson recently emphasized that the principal basis for his estimate was such factors as lung cancer from smoking and carcinogens such as aflatoxins in foods. He estimated that 1 to 5 percent of cancers are due to the occupational environment.

The cancer stampede has created opportunities for people in politics and others yearning for publicity; it has also been tempting to some scientists in government. A group from the National Cancer Institute, the National Institute of Environmental Health Sciences, and the National Institute for Occupational Safety and Health gave then HEW Secretary Califano alarmist estimates which he used in a speech on 15 September 1978. The speech, which was widely quoted, included the statement that during the next 30 to 35 years, 17 percent of all cancer deaths will be associated with previous exposure to asbestos. The backup report for the estimate (not in a peer review journal) was flimsy. For example, an important component of the cohort cited as being at future risk was people who had worked in shipyards during World War II. The authors provided no data about the age distribution of the workers. However, because of the military draft, the average age of working males was probably 40 to 45. By now, these people must already have made most of their contribution to cancer statistics. The report was attacked by many epidemiologists. Richard Doll, Regius Professor of Medicine at Oxford, wrote, "I regard it as scientific nonsense." An editorial in the British medical journal *Lancet* criticized the report, concluding with, "it is sad to see such a fragile report under such distinguished names."

The effort to prove a big role for industrial chemicals diverts attention from what is probably the best hope for reducing cancer incidence—careful study of foods and effects of cooking. It has long been known that the incidence of gastrointestinal cancers is highly variable, both temporally and geographically. For example, a variation of the incidence of esophageal cancer by a factor of 100 has been observed in China, and there is a strong correlation between prevalence and food. Yet expenditures to examine the role of food in cancer has been comparatively small here. Leadership has been seized by Takashi Sugimura, director of the National Cancer Center in Tokyo. He has used the Ames test and other related procedures to detect mutagens and carcinogens in raw foods. He has also conducted experiments on the effects of elevated temperatures on proteins and amino acids and has observed the resulting formation of strong mutagens and carcinogens. He has pointed to differences in food preparation as the reason why incidence of stomach cancer in Japan is twice that here. Sugimura and colleagues have also studied mutagenic effects of flavonoids, including the highly mutagenic quercetin and kaempferol, which are present in many edible plants, vegetables, and fruits.

All people ingest the mutagens and carcinogens of food daily. Far fewer are exposed to hazards in the workplace. It is now feasible to monitor the mutagens naturally present in food and to evaluate changes arising from cooking. A comprehensive investigation of foods and the products of cooking should have high priority.—PHILIP H. ABELSON