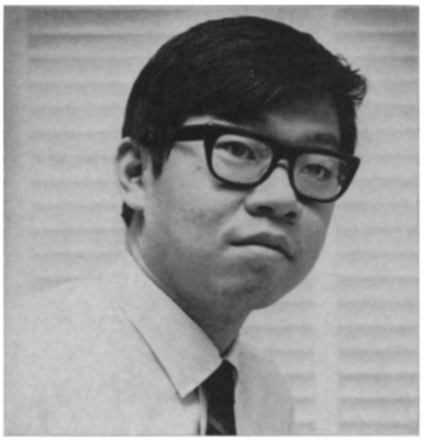
PRELIMINARY DATA

Chemists and cancer



Dr. Li: Findings suggest dangers.

X-ray technicians have a higher incidence of death from cancer than other occupational groups; miners more than anyone else die from tuberculosis and psychiatrists have the highest rate of suicide. High mortality rates peculiar to an occupation are nothing new. Scientists as a group are long-lived but no one has dissected the general category to see if the members of one discipline are more prone to a disease or early death than others.

The first step toward such a study—this one specifically for chemists—has been made by a physician at the National Cancer Institute. The closest thing to a precedent for Dr. Frederick P. Li's study was a survey by the U.S. Public Health Service in 1950, in which causes of death for professional and nonprofessional groups—chemists included—were tabulated, but only a small number of chemists' deaths was studied.

Dr. Li specifically selected chemists because of evidence indicating cancer following heavy occupational exposure to chemicals. His exploratory study was designed to determine if causes of death among chemists differed from the mortality of comparable professional groups.

After reviewing a 20-year period (1948-67), Dr. Li concludes that chemists have a higher proportion of deaths from cancers of the lymph nodes and the pancreas than normal.

Dr. Li bases his findings on studies of the death certificates of chemists listed in the obituary column of CHEMICAL & ENGINEERING NEWS, a publication of the American Chemical Society. He obtained the death certificates of about 3,500 ACS members from their states of residence. By comparing the number of deaths from a specific cause to the total number of deaths, he obtained a percentage of the frequency of death for a specific cause. He then compared his results with published data on the percentages of death from specific causes among other professional groups. There were 61 deaths from cancer of the lymph nodes among chemists, versus 34 expected deaths. For the pancreas, the figures were 36 deaths compared to 22 expected.

"These findings, based on unavoidably imperfect data, suggest that chemical carcinogens may have a role in the origins of lymphoid and pancreatic cancers, but further studies are needed to assess the magnitude of this hazard and to identify the causative agents," Dr. Li says.

Unfortunately, better statistical data on the mortality of chemists do not appear readily available. A problem is heterogeneity. If chemists were a uniform group, statistical studies would be easy. But because they work in many different areas, with many different chemicals, it is difficult to come up with generalized answers.

For example, in Dr. Li's sample, although the large majority was composed of practicing chemists at the time of death, there were some who were chemical engineers and some who were administrators.

"It's difficult to identify groups of chemists with similar exposure to specific chemicals," Dr. Li adds. "If such data were available, I would be interested in looking at it."

MOLECULAR ASTRONOMY

Water, silicates and diamond

Interstellar space was once considered the definition of a perfect vacuum. Over the years, however, it has shown itself full of various kinds of matter of increasing chemical complexity (SN: 8/17, p. 167). The latest entries are water, silicates and diamond.

The transition from the physics of interstellar space to a chemistry of interstellar space has been a gradual one. First, astronomers found clouds of dust and atomic gases in the regions between the stars. A few years ago chemical radicals began to be found. These are combinations of atoms such as OH, CN, or CH that form parts of ordinary compounds. In isolation they can exist by themselves, but when brought into contact with appropriate substances they react to form stable compounds. OH and H make water, for example.

Whether or not radicals can be called molecules seems to be largely a matter of taste, but observations of the last few months have turned up definite, unambiguous molecules of stable compounds.

Ammonia was the first to appear