some limited-resolution earth-based radar studies have ever been seen of the surface, however, and COMPLEX's first priority is to get a global map of the haze-ridden planet's ups, downs and types of terrain. Among other recommended goals are data on surface-atmosphere interactions and seismic activity (in part, perhaps, because some researchers have interpreted the limited radar data to suggest a recently or possibly even currently active planet) — both of which would be natural candidates for landing craft such as only the Soviet Union has ever sent to Venus. The panel thus calls for increased efforts at U.S.-Soviet cooperation up to and including "coordination ... with full disclosure of mission planning and objectives so as to optimize the scientific contributions of both nations." This could mean, for example, that the proposed U.S. Venus Orbiter Imaging Radar would map the planet, with both countries then working to pick the best sites for subsequent Soviet landers.

Besides the "terrestrial triad," says the report, earth's moon and the planet Mercury also form a related set, both nearly atmosphere-free and thus preserving a record of meteorite bombardment and solar-wind interactions that relates to the early history of the solar system.

- The moon: Measurements of the surface chemistry and heat flow on a global and regional scale are the committee's top priorities, along with efforts to seek the nature of any central metallic core. Remote-sensing capabilities developed since the Apollo program (and made possible in part by calibration from the Apollo moonrock samples) could be used from lunar orbit — an idea supported by many U.S. planetologists. Soviet robot spacecraft have returned samples to earth, and COMPLEX again advocates the possibility of the two nations cooperating. A U.S. "geochemical orbiter," for example, could identify promising sites, with Soviet craft later retrieving samples from those areas.
- Mercury: Only one spacecraft — Mariner 10 — has ever been there, and it merely flew by three times. The next step would presumably be an orbiter, and although there are numerous unanswered questions (the planet's density and proximity to the sun make it "a boundary to many cosmological theories"), there is also a limit to the ability of present technology to put a suitable payload into a circular orbit around the barren world. The panel thus recommends that Mercury be considered for study later in the decade, though not at the expense of the terrestrial triad.

The COMPLEX report also recommends planning with regard to comets, asteroids and interplanetary particles and fields. It furthur covers such nuts-and-bolts issues as the ability of the space shuttle and its planned auxiliary boosters to launch payloads of the necessary weights. NASA is reading the document with care. □

# Cancer statistics and views of causes

The public has been bombarded a lot lately, both by scientists and the press, with the notions that the United States is embroiled in a cancer epidemic, and that the epidemic is 80 to 90 percent due to industrial chemicals. Both concepts are now being challenged by an American Council on Science and Health report released last week, entitled "Cancer in the United States: Is There an Epidemic?"

Although many people are under the impression that the United States has one of the highest cancer death rates in the world, this is not so, the report claims, citing statistics from the World Health Statistics Annual, 1972-1973, published by the World Health Organization. In fact, according to this source, the United States ranks only 21st out of a list of 44 countries. What's more, the report declares, while there has been an increase in the absolute number of cancer cases in the United States in recent years, there has been a decrease in the real incidence of such cases when the incidence is adjusted for age. This time the report's source is the JOURNAL OF THE NATIONAL CANCER INSTITUTE (Vol. 60, p. 545, 1978). Why is age adjustment necessary? So that statistics from year to year can be compared without the distorting effects of changes in age distribution, the report explains. A population with more older people will have, all other things being equal, more cancer deaths than a young population. Still further evidence that the United States is not in the throes of a cancer epidemic, the report continues, is that while the overall cancer death rate among Americans has increased during the past few decades, it is by no means large. The report bases this conclusion on the latest published mortality report from the National Center for Health Statistics, which appeared in 1976, plus updated, nonpublished material that it obtained from the center.

As for challenging the prevailing concept that 80 to 90 percent of all cancers among Americans are due to industrial chemicals, the report points out that the much-used claim that "80 to 90 percent of all cancers are environmentally induced" originated with the International Agency for Research in Cancer in Lyon, France. That agency compared the high and low cancer death rates around the world and concluded that, because human cancer death rates vary so drastically from one country to another, some aspects of the environment, as opposed to genes, must cause most human cancers. The agency's conclusion, the report contends, then led to the widespread, unsubstantiated belief in many quarters that 80 to 90 percent of all cancers are caused by chemicals in the air, water, food and workplace.

The report then stresses, on the basis of statistics in the JOURNAL OF THE NATIONAL CANCER INSTITUTE, that whereas the incidence of most cancers in the United States has decreased in recent years, the incidence of one cancer — lung cancer — has increased dramatically. The report then points out that extensive studies have confirmed a link between smoking and lung cancer, and that the International Agency for Research on Cancer estimates that only one to five percent of all human cancers are the result of occupational hazards. The report also contends that "there is no convincing evidence that chemicals added to food increases the risk of any form of cancer," and that "the case for air pollution as a cause of human cancer is distinctly unimpressive." On the basis of all these data and conclusions, the report reasons that human cancers in the United States must be largely due to people's lifestyles, such as smoking, rather than to inadvertant exposure to industrially imposed chemicals.

It's unlikely, however, that all American cancer researchers will agree with this particular conclusion. Back in 1972, for instance, the National Academy of Sciences issued a report linking air pollution to lung cancer more impressively than ever before (SN: 9/16/72, p. 183). Last year, a study by the U.S. Department of Health, Education and Welfare predicted that 20 to 40 percent of all cancers that will strike Americans during the next several decades will be caused by workplace chemicals (SN: 9/30/78, p. 228). And last month, after analyzing the link between cancer and occupational chemical exposure, David Schottenfeld and Joanna Haas of the Department of Epidemiology and Preventive Medicine at Memorial Sloan-Kettering Cancer Center in New York City estimated that for American men at least, workplace chemicals may account for five to 20 percent of all cancers.

The American Council on Science and Health, located in New York City, was recently founded by Elizabeth M. Whelan, who holds a doctorate from the Harvard School of Public Health, Fredrick J. Stare, a physician and nutritionist with the Harvard School of Public Health, Thomas H. Jukes, a scientist with the University of California at Berkeley and some other nonindustry scientists who contended that an organization should be formed to dispassionately, scientifically evaluate the relationships between environmental chemicals and human health. The council is funded by private foundations and individual contributions and not by the food or chemical industries, at least for the present, in order to remain as independent as possible. This, the council's first report, was prepared by Whelan, who heads the council, with the help of two staff members and also with inputs from various university scientists, medical center physicians and staff members of the American Cancer Society. □