

reduction reactions, or with and without terrestrial nutrients).

The tendency to lean one way or the other on the question of Martian life, according to Cornell astronomer and Viking team member Carl Sagan, represents "an intolerance for ambiguity." There are questions for which a partial solution can reasonably be expected to yield valid expectations for the final answer, he says, "but this isn't one."

At the symposium, sponsored by NASA and by the National Academy of Sciences' Space Science Board, several researchers presented results of laboratory experiments attempting to account for aspects of the Viking results. But there were also indications that lack of information-exchange and of coordination has plagued the overall effort. Equipment set-ups were questioned, data were disputed and at least two participants have since said that it will take better organization of the quest, which now spans the United States and beyond.

"I think that [that realization] is the best thing to come out [of the meeting]," says Ichtaque Rasool, NASA deputy associate administrator for science, who agrees that "the question . . . has not been resolved." A "coordinated type of study is needed," he says, and Richard Young is now exploring possible ways to accomplish that. Whether the result will be some kind of centralized panel, charged with making sure that all the researchers know what the others are doing and how, is not yet determined, but even some scientists who have made past statements on the "negative" side have agreed that a well-thought-out approach could help.

There is a further fear among some scientists, including Levin, Sagan and others, that premature views about "leaning away from biology" could lead to a reduction in efforts to find a real answer. Not even Levin, who has long been the "optimist" among the Viking principal biologists, argues that there is life on Mars. He does, however, lament what he calls "a schizophrenia," in which, although the question is unresolved, NASA officials and others "make statements in a non-scientific way . . . that the chances for life are unlikely."

One complaint of those who worry that the question is not being kept open is the oft-cited failure of the Viking landers to detect any organic material in the Martian surface material. Some members of Viking's organic-analysis team are said to be angry that they are being "used as a crutch" by some of the biologists, since the instrument, a gas chromatograph/mass spectrometer, is a far less sensitive detector of organic activity than at least one of the biology instruments. The GCMS, says Levin, could see as few as 1 million *E. coli* cells per gram of soil, yet samples have been found in earth's Mojave desert with as few as 100,000—obviously present, yet they would be invisible to the GCMS. □

Breast cancer screening: How, who, when

Breast cancer is the leading cancer killer of women in the United States. But it is much easier to save lives if breast cancer is diagnosed early. Consequently, the National Cancer Institute would like to routinely screen asymptomatic women for this disease in the hope of detecting it in its earliest stages. In fact, since 1973, 250,000 American women have been screened at NCI breast cancer screening demonstration projects at 27 medical centers.

Soon after these projects got off the ground, however, they became embroiled in a controversy: Which screening techniques are effective and safe, and at what age should women be screened (SN: 8/7/76, p. 90)? Last week the NCI convened a three-day meeting to present the latest scientific information on these and related questions and to have a panel of clinicians, lawyers, ethicists and concerned citizens attempt to come up with some answers to them. The panel was headed by Samuel Thier, chairman of internal medicine at Yale University.

The meeting was important for two reasons. It was the first time that the National Institutes of Health had ever organized a meeting to develop a consensus on an issue of clinical significance. Or as NIH Director Donald S. Fredrickson put it, "This is an experiment to quicken decisions about scientific matters with social dimensions." Also, the panel's conclusions and recommendations should influence the health of American women during the next decade. The NCI is taking women's needs and safety into consideration before it decides whether the breast cancer demonstration projects should live out their remaining two-to-three year projected term or whether any other breast cancer screening policy should be implemented.

A number of important findings came out at the meeting:

- The demonstration projects show that early detection of breast cancer is definitely possible. So far, nearly 2,500 cancers have been detected, and 70 percent of them were in the earliest stages.

- Thermography (the use of heat to detect early breast cancers) is not particularly effective in its present stage of technology, the NCI breast cancer demonstration projects show. In contrast, mammography (the use of X-rays to detect early breast tumors) is highly effective, particularly when combined with palpation (manual exploration of the breasts for cancerous lumps). However, mammography undoubtedly also carries the risk of causing—as well as of detecting—breast cancer because cumulative X-ray exposure, at least in doses higher than those used in mammography, has triggered breast cancer (SN: 8/7/76, p. 90).

The question, then, is whether the

benefits of early detection by mammography outweigh the potential risks. The only other American breast cancer screening program conducted to date—by the Health Insurance Plan of New York during the 1960s—has shown that mammography, combined with palpation, can help save the lives of breast cancer victims past the age of 50. However, it has not demonstrated the same effectiveness for victims younger than the age of 50. What's more, breast cancer is more likely to occur in women older than the age of 50, and these women will probably be exposed to fewer X-ray screenings than younger women with a longer life ahead of them. Thus, the benefits of mammography appear to outweigh the risks only for women beyond the age of 50, at least in the absence of more firm data on the question. Nonetheless, the levels of radiation used in mammography have fallen sharply since the NCI projects were launched in 1973, and one-fourth of all cancers detected by mammography in the projects have been in women younger than the age of 50. "This raises the important possibility that screening may, in fact, be beneficial under the age of 50 years and that mammography may be a significant factor at all ages," declare Oliver H. Beahrs, a surgeon at the Mayo Clinic, and other scientists who assessed the NCI projects and reported their findings last week.

Based on these and other data, the panel arrived at several conclusions and recommendations:

- The NCI demonstration projects should be completed—at least the routine screening of women past the age of 50. However, women between the ages of 40 and 49 should be screened only if they have a family history of breast cancer, and women from the ages of 35 to 39 should be screened only if they have already had breast cancer. (Similar interim guidelines, in fact, have been in effect since May.)

- Certain ethical mandates should be imposed on the projects since they are partly experimental in nature. These include the use of informed consent forms (already in effect since the summer of 1976) and the requirement that any diagnoses of breast lesions less than one centimeter in diameter be reviewed by two pathologists, rather than one, before treatment is decided on. (About 50 NCI project participants have had their breasts removed unnecessarily because of incorrect diagnoses, the Beahrs group has found.)

- Scientific studies or other efforts should be made to determine the benefit-versus-risk ratio for mammography among women younger than the age of 50 and to explore the true potential of less dangerous detection techniques such as thermography. □