TMI stress: The long goodbye

Just as physical difficulties continue to surround Three Mile Island more than a year after the nuclear plant's accident, an emotional residue lingers on among area residents. The latest measurable problem was discovered last week when traces of radiation were found in test wells drilled around the base of the reactor containment building.

Somewhat less dramatic but possibly more lasting are the psychological aftereffects. While many of the "acute" reactions have dissipated along with the threat of impending, immediate danger, some other, subtle, effects appear to show few signs of disappearing, according to a research report for the U.S. Nuclear Regulatory Commission by Mountain West Research, Inc., with Social Impact Research, Inc.

"There is some evidence that stress has persisted since the emergency period," say researchers C.B. Flynn and J.A. Chalmers, who interviewed residents and studied a variety of statistics compiled since the accident. The results show that just slightly more than one quarter of the respondents perceive TMI as no threat to their safety, while one quarter still feel it is a very serious threat. Say the researchers: "...TMI has clearly become a substantially greater source of stress" than it was prior to one year ago.

The survey results showed that some ill effects present during the emergency period were of short duration. They included demoralization, overeating, loss of appetite, sleep difficulties, shakiness, unclear thinking, irritability and extreme anger. "However," report Chalmers and Flynn, "the more somatic symptoms, such as rash, headache, stomach trouble, diarrhea, constipation, frequent urination, cramps and sweating spells continue to affect a small percentage of the population."

And though the day-to-day existence of most residents has returned to normal, there remains considerable concern about the ongoing status of the plant and of evacuation plans. "At present, there is no trustworthy source of information for laypersons about what happened in the past nor what is happening currently at TMI," states the report. "For some, this continuing lack of clear, unambiguous information contributes to continuing stress."

Such stress — both psychological and economic (SN: 4/5/80, p. 216) — prompted TMI's holding company, General Public Utilities Corp., to commission a study to decide what to do with the crippled plant. The study, released last month, showed that the nuclear plant could be converted to burn coal or natural gas at a cost of $1.7 billion. □

Defoliant, cancer: Studies show link

Five studies recently released by two members of Vietnam Veterans in Congress have the Veterans Administration under fire in the Agent Orange battle. The studies indicate that two components (2,4,5-T and 2,4-D) and a contaminant (dioxin) of the herbicide Orange — sprayed by the Department of Defense from 1965 to 1971 in Vietnam to defoliate enemy cover and to destroy food crops (SN: 3/17/79, p. 166) — probably cause cancer in humans. The results of the studies contradict VA statements that there is no evidence linking exposure to Agent Orange to cancer in humans (SN: 1/26/80, p. 55).

Two of the studies involved an analysis of the causes of death among Swedish railroad workers exposed to phenoxy acids (such as 2,4-D and 2,4,5-T) and among BASF (a major chemical industry in West Germany) employees exposed to dioxin. Results of the independently conducted studies show that the incidence of fatal stomach cancer among the exposed workers in Sweden and West Germany was slightly higher than the respective national mortality rates for that cancer.

Two other studies, reported by Lennart Hardell and colleagues of the University Hospital in Umeå, Sweden, investigated the possibility of phenoxy acid exposure in patients with a rarer cancer — soft-tissue sarcoma. Hardell matched patients with that cancer with healthy controls and investigated their histories of exposure to phenoxy acid. He found more reports of exposure among the cancer patients. Moreover, because "a certain possibility exists that the [cancer] cases will have a greater interest in the questions than the healthy controls do," Hardell tested for possible distortions in his assessment of exposures and concluded it was insignificant in his study.

The results of the fifth study, also headed by Hardell, implicate phenoxy acid exposure as a risk factor in the incidence of cancer of the lymphatic system.

When congressional veterans David Bonior (D-Mich.) and Tom Daschle (D-S.D.) released the five studies they had obtained from the Environmental Protection Agency, they also sent a letter to VA Administrator Max Cleland. Cleland's failure to include the studies in a March 26 "Agent Orange packet" released by the VA "serves to create the impression that the VA makes available only studies which appear to reinforce a position that exposure to Agent Orange does not create adverse health effects," the congressmen wrote. VA spokesperson Marthena Cowart says that Cleland had not seen the studies prior to release of the VA packet. □

Mars: Radar hints at liquid water

It is the essence of drought — a parched, planet-wide desert more arid than any on earth. Yet Mars is not without water — great icecaps at the poles, frost elsewhere on the surface, vapor in the atmosphere, water of hydration bound in the "soil" and perhaps frozen into permafrost. What has seemed missing is the liquid kind — with one possible, and highly controversial, exception. Centered about 25° south of the Martian equator is a region called Solis Lacus, where spectroscopy and other remote-sensing data have suggested to Robert Huguenin of the University of Massachusetts that unusual amounts of water vapor are periodically "outgassed" from beneath the surface. Possible links between the outgassing and Martian dust storms, as well as the fact that the area is the closest spot on the planet to the sun when Mars is at the most sunward point in its orbit (Solis Lacus means Lake of the Sun), have prompted Huguenin to describe the region as an "oasis" and "the wettest spot on the planet" (SN: 8/11/79, p. 108). He doesn't mean a real lake, or even a pond — just a little liquid water beneath the surface. But on dry, cold Mars, such a find would be notable. And at some of the meetings at which Huguenin has presented his interpretations, reactions have included some strong skepticism.

Now a similar interpretation from a different kind of data has been tossed into the fray, and its authors, though "convinced" of their conclusions, are wary of the flap that may result. The data, according to Stanley H. Zisk of Haystack Observatory in Westford, Mass., are fine. "It's the interpretation that worries me," he says. "I just can't believe in Santa Claus."

The data are radar scans of Mars, made in 1971 and 1973 with the Goldstone antennas in California's Mojave Desert by George Downs of Jet Propulsion Laboratory, who also reduced the data. Besides analyzing the planet's topography, Downs measured the variations in the dielectric constant — an indicator of radar reflectivity — and those in a quantity called the "c-factor," which essentially shows the smoothness of the surface or near-surface layer doing the reflecting. To Zisk and to Peter Mouginis-Mark of Brown University, the interpretation seems virtually unavoidable.

First, they mapped the radar-covered parts of the planet for which the reflectivity was high (greater than 9 percent), which included Solis Lacus (or at least its northern portion — the radar coverage extended down only to about 22°S). High reflectivity could be due either to liquid water (ice is almost transparent to