TMI fallout: Demoralization

While the immediate physical health consequences of last March's Three Mile Island accident appear at this point to be minimal, the emotional aftershocks were significant enough to cause concern among those studying the mishap. "The major health effect of the accident appears to have been on the mental health of the people living in the region of Three Mile Island and the workers at TMI," the President's Commission on the Accident at Three Mile Island reported recently.

According to the Commission's staff report on behavioral effects, "there was immediate, short-lived mental distress produced by the accident among certain groups of the general population living within 20 miles of TMI." And although these problems were temporary for most persons, workers at the plant "continue to show relatively high levels of demoralization," the report states.

Among a representative sample of interviewees living within the 20-mile radius, the commission found last April that "a substantial minority, perhaps 10 percent, experienced severe demoralization ... at the time of and in the two or three weeks following the accident." This was more than a simple feeling of uneasiness about the accident; when assessed by standard mental health measures, the TMI-induced demoralization was "as severe as that reported by persons suffering from chronic mental disorders [measured among patients at mental health centers]," according to the staff report. "This is not to say that 10 percent of the sample became mentally ill as a result of the accident," the investigators quickly note. But it "is a clear sign that something is wrong."

While the "unusually high levels" of demoralization "apparently subsided after April," according to the staff report, "some of the other behavioral effects of the accident did not dissipate so rapidly." Although it declined after April, the level of distrust of authorities "has remained relatively constant from May on," says the report.

Though the demoralization — most apparent among mothers and teenage siblings of preschool children and among persons within five miles of the plant — seemed to subside among the general population, workers at TMI "were clearly still more demoralized than men in the general population in late August and September," report the researchers. In addition, the TMI workers were rated more demoralized than workers at the Peach Bottom nuclear plant, about 40 miles away. " ... the TMI workers' predicament has not been resolved," states the report. "Their level of demoralization has not returned to normal following the accident as has been the case with our other samples of adults in the general population of the TMI area." □

'Boozing' versus heart attacks

A couple of shots a day keeps heart disease away — at least that's the implication of recent research findings. Daily consumption of small to moderate amounts of alcohol is supposed to protect the drinker against death due to heart disease by increasing the levels of high-density lipoproteins and decreasing low-density lipoproteins in the blood (SN: 8/13/77, p. 102). But does alcohol really protect against heart disease deaths, or might it be some other chemical or chemicals in the alcoholic drinks that do the trick? The answer, according to Charles H. Hennekens of Harvard Medical School and his colleagues, is that alcohol, not some other chemical, is providing the protection. The researchers found that the lowered risk of coronary deaths is remarkably similar among light to moderate users of liquor, beer and wine, after adjustments are made for the differences in alcoholic content of each of these beverages. Their report is in the Nov. 2 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Hennekens and colleagues studied 284 men who had died from heart disease and 284 men who were still living and who matched the deceased subjects for age and neighborhood. Spouses of both groups of subjects were interviewed about their husbands' drinking habits. The investigators then compared the risk of heart disease deaths for light to moderate drinkers with those for nondrinkers, and for heavy drinkers versus nondrinkers. The researchers defined a light to moderate drinker as one whose consumption was less than or equal to two ounces of alcohol daily. This would be comparable to 40 ounces of beer, 12 ounces of wine or 4 ounces of liquor. The investigators defined a heavy drinker as anyone consuming more than two ounces of alcohol daily.

As Hennekens and his team report, daily consumption of small to moderate amounts of alcohol is correlated to low levels of coronary death, and the relationship is virtually the same for beer, wine or liquor. In contrast, there is no association between heavy alcohol consumption and heart disease deaths.

It is possible, of course, that the protective effect against heart disease deaths found among light and moderate drinkers isn't due to any chemical, alcohol included, but to some other factor, Hennekens and his co-workers concede. For instance, they point out that light to moderate drinkers may be easygoing, "Type B" personalities, whereas abstainers and heavy drinkers may be excessive, hard-driving, "Type A" personalities. Type B personalities have been found to be considerably less prone to heart attacks than are Type A personalities (SN: 9/20/75, p. 182). More study will be needed to determine whether alcohol, personality or some other factor is the coronary protector.

However, as W. P. Castelli of the National Institutes of Health points out in an accompanying JAMA editorial, there are 17 million alcoholics in the United States, and there is a strong genetic component to alcoholism. "The problem," he cautions, "is that it may be dangerous to tell some people to take two drinks a day when, given their constitutional makeup, one could fairly predict they could not stop at two." □

Innovation policy on the right track

Billed as the administration's "first steps" to ensure the nation's continued role as a world leader in technological development, President Jimmy Carter last week unveiled his industrial-innovation package. While congressional leaders greeted the long-awaited initiatives with reserve and lukewarm praise, the small-business community was somewhat more receptive, although not totally satisfied.

"What I find especially troublesome is the glaring omission of any tax incentives," complains Rep. John J. LaFalce (D-N.Y.), chairman of the House oversight subcommittee on small business. Echoing many of his colleagues, LaFalce said it could take years before industry and government respond to the President's proposals with changes in laws and investment policies, whereas tax-break stimuli could effect immediate change.

Sen. Donald Stewart's (D-Ala.) major complaint was that Carter's initiatives lack prescriptive goals that would force federal agencies to alter the proportion of research-and-development money going to small businesses and that of the procurement contracts awarded to small businesses. Citing testimony by National Science Foundation administrators last year, Stewart said experience has proved that agencies don't change the way they do business unless forced.

Others complained that the funds that would be committed to the program — about $400 million, roughly 90 percent of which would be redirected from other federally budgeted items — represents a paltry commitment to such an allegedly vital area. But Dave Kramarsky of the National Small Business Association took exception to that, saying that "the existing funds for R&D are sufficient if they're applied properly." Given the choice between new government money and new programs to encourage innovative development, "we'll take the new programs," he told SCIENCE NEWS. And new programs provide the

heart of the Carter initiatives.

Among proposals in Carter's nine-point program are recommendations to:

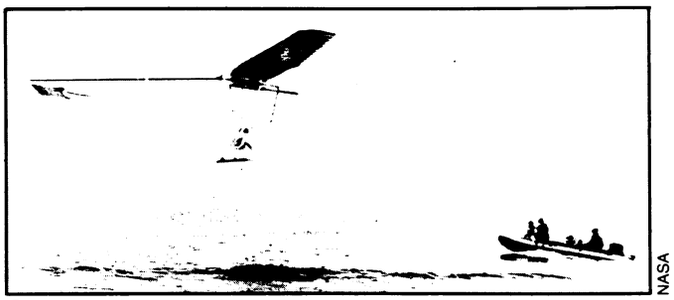
- grant exclusive licenses to inventors for products or ideas they develop under government contract (patents remain with the government), except when doing so is not in the public interest or is inconsistent with goals of the funding agency,
- substitute, where possible, performance standards for design or specification standards in government regulations, encouraging new solutions to stated goals,
- expand the NSF program funding small firms for analysis of new projects and technology demonstration — from $2.5 million to $10 million (Carter would eventually involve other agencies and increase annual funding to $150 million),
- establish an Office of Small Business Patent Counsel to aid inventors in moving from idea development to marketing,
- clarify antitrust law on joint ventures between big and small businesses,
- establish nonprofit centers at universities or in industry to develop and transfer generic technologies — such as robotics, welding and corrosion prevention (centers would be jointly financed by government and industry, with the federal share falling to 20 percent by the fifth year of operation), and
- establish state- or multi-state corporations for innovation, which, with matching federal funds, would provide venture capital, management assistance and guidance to those applying for the NSF grants. □

Magsat launched

On Oct. 30, NASA launched the first spacecraft designed exclusively to measure the earth's magnetic field, including anomalies in the field that may reflect differences in the earth's crust. The crust may vary in magnetism due to geothermal activity, tectonic activity or underlying deposits of dense rock such as ore. Mapping the slight anomalies in the magnetic field — whose overall strength is barely that of a toy magnet — may aid in mineral and petroleum exploration and may improve geological mapping.

Called Magsat, for Magnetic Field Satellite, the joint NASA-U.S. Geological Survey-sponsored satellite will have a pole-crossing orbit that will range from 350 kilometers to 500 km in altitude. This relatively low altitude will provide, it is hoped, extremely high resolution. Unlike previous satellites (SN: 5/24/75, p. 340), which measured some magnetic field characteristics in addition to other operations, Magsat is a single-experiment satellite with an expected lifetime of only 120 days. It will carry instruments that measure both the magnitude and the direction of the field. At least three complete sets of global data are expected during its short lifetime. □

Gossamer Albatross to take the high road



NASA

Gossamer Albatross 1: Its twin will fly higher.

When a fragile, pedal-driven vehicle called the Gossamer Albatross on June 12 became the first human-powered aircraft to fly the English Channel, it skimmed over the waves at altitudes ranging from about six inches to perhaps 15 feet, traveling no faster than 14 miles per hour. Now the National Aeronautics and Space Administration is about to send the plane's twin, the Gossamer Albatross 2, to a far loftier environment: 70,000 to 85,000 feet above the earth, and at speeds up to seven times that of the channel crossing.

The plane's huge wingspan (94 feet) and low weight (about 70 pounds) give it extremely high lift and the ability to fly slowly (compared to jets and most propellor-driven fixed-wing craft), which interest both NASA and military researchers in regard to several applications: As a high-altitude communications platform, says Raymond E. Rose, NASA program manager for general aviation, such a vehicle might be able to stay aloft for as long as several months with high-output batteries for power, performing some tasks difficult for satellites. High-resolution atmospheric measurements could be another possibility, and one can imagine military interest in the craft's ground-observing potential, since it would offer more speed and controllability than a balloon, better resolution than a satellite, yet could spend longer over a target than could, say, a speedy U-2.

A two-month series of flight tests is expected to begin by Dec. 1 at NASA's Dryden Flight Research Center in California, under a $65,000 contract to AeroVironment Inc., headed by Paul MacCready, who designed and built both Albatrosses and their predecessor, the Gossamer Condor. Some human-powered flights may be included in the tests, but, says Rose, the high-altitude excursions will be done with the craft rigged for remote control from the ground and driven by an electric motor. A balloon may be used to carry the Albatross 2 to test altitudes, which may be as great as 100,000 feet. Even with no pilot aboard, however, weight will be a concern, with only about 155 pounds available for motor, batteries, other control equipment and test instrumentation. □

Treating malnutrition: Food is not enough

Children need both adequate nutrition and emotional stimulation in order to develop normally; deprived of either, they lag behind in physical and mental growth. Now, evidence suggests that the ill effects of these two deficiencies are intertwined to an extent not recognized previously. What we know as malnutrition may come from more than a lack of nutrients, and more than an adequate diet may be needed to correct it. Joaquin Cravioto of the Instituto Nacional de Ciencias y Tecnologia de la Salud del Nino-DIF in Mexico City presented these findings at the annual meeting of the Institute of Medicine in Washington.

For three years, Cravioto and colleagues followed the progress of a group of children who, at birth, were approximately equal in height, weight, skull circumference and other physical characteristics. They looked at the children's nutritional status as well as at their psychosocial, language and motor development. Using an Inventory of Home Stimulation, the researchers evaluated the quality of the children's language environment and of the interactions between mother and child, including expressions of affection, interest in the child and sensitivity to his or her behavior.

A curious pattern emerged. Cravioto found that by looking at the Home Stimulation scores, he could identify those children who would become malnourished six months to two years before they began to suffer from malnutrition. The "future malnourished" children had poor quality language environments (suffering from what Cravioto calls "vocal malnourishment"), and their mothers tended to be passive and nonreactive toward the children, not proud or admiring.

The intermingled effects of stimulation and nutritional intake continued when the children were hospitalized for treatment. One group lived in a livened-up hospital environment and received systematic stimulation from the staff. The remaining children stayed in a normal (i.e. unstimulating) hospital environment. Both groups recovered physiologically, but only the stimulated children caught up mentally and emotionally. □