

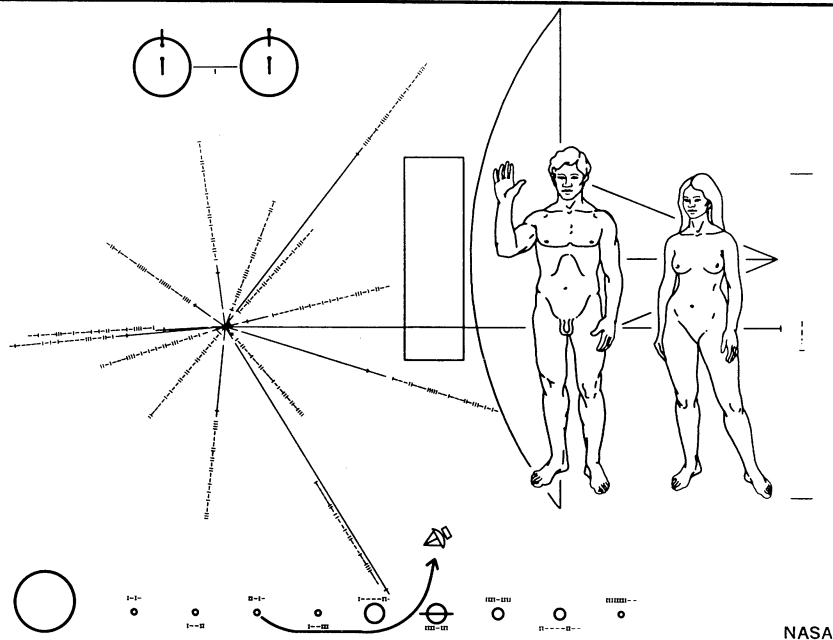
Pioneer F's interstellar message to the future

The Pioneer F spacecraft, destined to be the first manmade object to escape from the solar system into interstellar space, carries this pictorial plaque. The primary mission of the probe, scheduled for launch Feb. 27, is to fly by and observe the planet Jupiter (SN: 11/13/71, p. 330), but it will eventually travel beyond the orbits of the outer planets and out of the solar system.

The plaque it carries is designed to show scientifically educated inhabitants of some other star system—who might intercept it millions of years from now—when Pioneer was launched, from where, and by what kind of beings. The design was devised by Carl Sagan and Frank Drake of Cornell University and Sagan's wife, Linda Salvman, an artist. It is etched into a gold-anodized aluminum plate, 6 by 9 inches, attached to the spacecraft's antenna supports.

Here is their description of Pioneer's message:

The radiating lines at left represent the positions of 14 pulsars—cosmic sources of radio energy—arranged to indicate our sun as the home star of the launching civilization. The symbols at the ends of the lines are binary numbers that represent the frequencies of these pulsars



at the time of launch of Pioneer F relative to that of the hydrogen atom shown at the upper left with a "1" unity symbol. The hydrogen atom is thus used as a "universal clock," and the regular decrease in the frequencies of the pulsars will enable another civilization to determine the time that has elapsed since Pioneer F was launched. The hydrogen atom is also used as a "universal yardstick" for sizing the human figures and outline of the spacecraft shown on the right.

The hydrogen wavelength—about 8 inches—multiplied by the binary number representing "8" shown next to the women gives her height—64 inches. The figures represent the type of creature that created Pioneer. The man's hand is raised in a gesture of goodwill. Across the bottom are the planets, ranging outward from the sun, with the spacecraft's trajectory arcing away from earth, passing Mars, and swinging by Jupiter.

The uncertain promise of banking sperm

A vasectomy—removing a section of a man's sperm ducts to induce sterility—is a virtually irreversible operation. To insure that they may father children at a later time if they wish, many men contemplating vasectomies have been depositing a quantity of their semen with sperm banks where, for a fee, it is frozen and stored.

In theory, therefore, sperm banks provide a man with a way of hedging his commitment to permanent sterility. In a statement issued last week, however, the American Public Health Association's Council on Population expressed serious reservations about the effectiveness of sperm frozen more than 16 months. There is wide disagreement on the length of time that sperm may be frozen and then thawed and used successfully to impregnate a woman, with estimates ranging from only 16 months to as much as 10 years. The number of births that have resulted from use of frozen sperm is also disputed—anywhere from 112 to more than 400. Further, as one member of the Population Council points out, the most complete animal experimentation

on sperm freezing has used bovine sperm, and bovine results may or may not apply to humans. In all, said the council, "the biologic potency and genetic adequacy of human sperm which has been frozen and stored over a protracted period of time and then thawed remains to be established."

There are at least five commercially operated sperm banks now in operation in the United States. Though such banks generally guarantee only storage—not fertility of the frozen sperm—the APHA Population Council expressed concern that sperm banks are not providing clear information on success rates of freezing and that potential users may be misled by exaggerated claims of effectiveness. □

Alcohol and society

Alcohol is the most abused and the most abusing drug in the United States, says the Department of Health, Education and Welfare. In the first of three special reports to Congress, HEW's National Institute on Alcohol and Alcoholism estimates there are 95 million drinkers in the country. Some 9.6 million of them are alcoholics or abusers of the drug. Their lives are shortened by 10 to 12 years. Every year they cost

employers \$10 billion in lost work time and they cost taxpayers \$5 billion in welfare and property damage. One-third of all homicides and one-half (28,000) of all traffic deaths per year are related to alcohol.

HEW did not ask for legislative action for America's largest untreated, treatable illness. Instead, a comprehensive Federal effort (including a \$200,000 advertising campaign) to unify treatment, rehabilitation and prevention programs was recommended. "We are not telling people to drink or not to drink," said Morris E. Chafetz, director of the alcoholism institute. "What we are saying is that if one chooses to drink, he has a responsibility not to destroy himself or society." □

Maria Mayer dies

Maria Goeppert Mayer, professor of physics at the University of California at San Diego, died Feb. 20 in San Diego at the age of 65.

In 1963 she and J. H. D. Jensen and Eugene Wigner shared the Nobel Prize in Physics, which was given for work in the theory of nuclear structure. She was the first woman to win the physics Prize since Marie Curie shared it with her husband Pierre in 1903. □