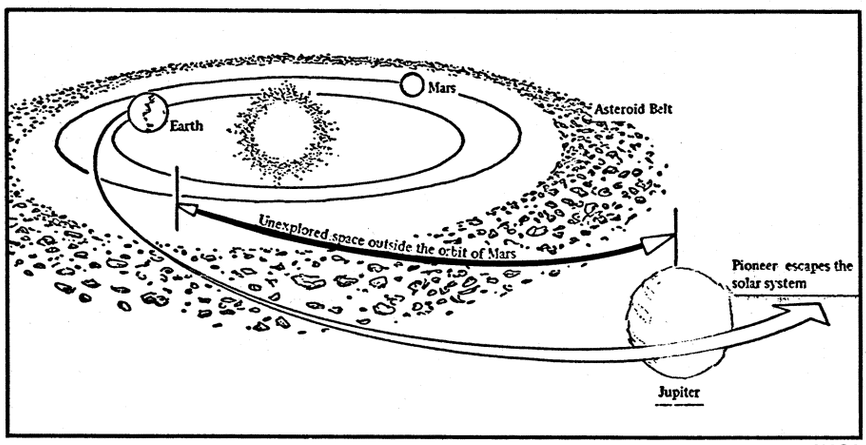
Republic of China resolution passed. The Chinese resolution claimed the social causes of the environmental crisis lay primarily in "monopolistic capitalist groups" and the "imperialistic policies of the super powers and their wars."

And the United States came under fire from leaders of developed nations, too. Swedish Premier Olaf Palme, in a statement of rare frankness from a Western nation, termed U.S. devastation of the Vietnamese countryside an environmental "outrage." Train suggested it was in bad taste for Palme to introduce such a controversial topic.

In an area where the United States no longer has any direct interest, a U.S. proposal for a 10-year moratorium on commercial whaling won unexpected unanimous approval (with Japan, Brazil and South Africa abstaining). But the same majority that gave such resounding approval to this obviously beneficent U.S. proposal voted against the United States most of the time.

Pioneer 10: Hoping against a hit



NASA

Pioneer 10 passes the orbit of Mars and prepares to enter unknown territory.

Pioneer 10 was launched March 2 on a flight to Jupiter (SN: 3/11/72, p. 167). It has now survived the perils of the "Great Galactic Ghoul" and is headed toward its next big test—the asteroid belt. (The region scientists call the "Great Galactic Ghoul" is just inside the orbit of Mars. Several spacecraft have encountered difficulties in this region believed to be from meteoroid hits.)

The craft, traveling 120,000 kilometers per hour, will enter the asteroid belt July 15 when it is 299 million kilometers from the sun. If the amount of cosmic dust already encountered by the craft is any indication of what it will see inside the belt, Pioneer 10 may be hit more often than had been expected. "We really don't know what we might see inside the belt," says Robert K. Soberman of the General Electric Co. Soberman is in charge of "Sisyphus" an array of four meteoroid/asteroid telescopes aboard (SN: 11/13/71, p. 330). The instruments have recorded from two to ten times more dust than he had expected. The particles are about 10 times brighter than expected and traveling about 16,000 kilometers per hour. The largest ones have been millimeters to centimeters in size.

Another instrument aboard records particle hits as small as 10^{-9} grams. It is composed of 234 pressurized cells mounted on the outside of the spacecraft. William H. Kinard of NASA's Langley Research Center has recorded 41 penetrations so far—about five times as many particle hits as predicted.

According to one theory called the Poynting-Robertson effect, dust particles move into the sun in a slow spiral. The smallest particles move very fast, are not caught up by planets and fall into the sun. The largest particles and intermediate-sized particles move slowly enough so that they spend a long time in the orbits of planets and eventually are swept up by them. This is exactly what Pioneer saw as it entered the orbit of Mars in May. Kinard saw no decrease in the number of smaller particles. Soberman, however, did see a decrease in the number of intermediate-sized particles, confirming the theory.

One other theory has been verified by Pioneer 10 data. According to Jerry Weinberg of Dudley Observatory, the gegenschein (SN: 4/4/70, p. 354) is not of terrestrial origin. The gegenschein is a spot of light at the antisolar point believed to be sunlight reflected off debris in space.

Pioneer's chances of surviving the asteroid belt are variously estimated from one chance in 10 for a lethal hit to less than one chance in 100 million of a hit. If it does emerge unscathed after seven months in the 280-million-kilometer-wide belt, it will get to Jupiter Dec. 3, 1973. □

Human cancer viruses: Long haul ahead

If anything came out of the national symposium on membranes, viruses and immunity sponsored by the Bell Museum of Pathology at the University of Minnesota last week, it is that there is a lot of work ahead for scientists in trying to prove that a virus causes human cancer. As George Todaro and Wade Parks of the National Cancer Institute emphasized, no human candidate tumor virus has yet been confirmed to be the real McCoy. One of the problems is that relatively few laboratories have the expertise to isolate and identify candidate tumor viruses from the tissue of cancer patients, and even these scientists are pushing available techniques to the limits to indirectly show that tumor cells contain viruses closely related to animal tumor viruses.

For example, one of the biochemical techniques being used by Sol Spiegelman's group at Columbia University and by Maurice Green of St. Louis University is hybridization. They have found that DNA synthesized by a mouse tumor virus interacts with RNA from human tumor cells. Assuming that there is a crossing-over of genetic information, one might logically assume that a virus similar to the mouse RNA tumor virus has altered the genetic makeup of the human tumor cells in some manner. But the crossing-over Spiegelman and Green have obtained so far is low, so most cancer scientists are not convinced that this evidence proves that a tumor virus has altered human cancer cells.

Another approach several groups are investigating is a viral antigen competition assay. Viral antigen from animal tumor viruses is put into an animal so that the animal makes antibodies against it. The antigen is then made radioactive. The radioactive antigen and antibodies are mixed with a candidate human tumor virus. If the candidate virus competes with the radioactive antigen for the antibody, then one can conclude that the human virus is closely related to the animal tumor virus.

But neither hybridization nor immunologic detection of viral antigens, Todaro and Parks concur, will prove that a human virus is really a tumor virus in natural cancer. Todaro declared at the symposium that the strongest proof that a virus transforms a normal cell would be to detect some new messenger RNA in a cell that hybridizes with DNA made from viral RNA. Such evidence would strongly suggest that the DNA form of the virus in the cell, the m-RNA and, in turn, viral proteins, are directly involved in transforming cells to tumor cells. Todaro says he and some other researchers are now working in this direction. □