

power of the Office of Education, which also has better connections to the other HEW agencies."

Concern has centered on the difference in philosophy between the two agencies:

The Children's Bureau is seen as considering a cultural approach that would include the child's outside environment as well as his classroom work. The Office of Education, on the other hand, with its natural concern for teaching methods, is seen by some Headstart partisans as having too narrow a focus, one that is centered on the classroom alone. On the other hand, as Job Corps' Theodore Jones observes, "If Headstart wound up in the Children's Bureau, it might become just another nursery school program."

With the great concern voiced by President Nixon for poor families with young children, Price notes, the Administration did not want to imply that it was overlooking the equally difficult problem of poor families with adolescent children. "The President placed the emphasis on families with young children because he felt that this segment of the population had been too often overlooked before," Price says.

"I didn't think the President would drop any of the major Great Society programs," Columbia's Prof. Piven says. "It would be too dangerous to alienate blacks in the big cities, especially since he wants to pick up 10 or 15 percent of their vote. If he does this, it would give him the big states."

In last year's election, the President lost New York, Pennsylvania, Michigan and Texas. ◇

## BUSY WEEK

### Focus on Mars

Seldom has the planet Mars received as much attention as it did last week.

On Sunday, the California Institute of Technology's Jet Propulsion Laboratory announced that scientists there and at McDonald Observatory in Texas would be spending much of 1969 studying Mars' atmosphere to see whether it is capable of supporting life.

Then on Monday the Mariner 6 spacecraft was launched from Cape Kennedy on a 226-million-mile journey to Mars. It will fly to within 2,000 miles of the planet on July 31 and transmit television pictures and other images back to earth.

On Tuesday, the National Aeronautics and Space Administration announced the selection of eight teams of scientists to advise on the design and development of a soft-landing capsule to reach the Martian surface in 1973.

The only spacecraft that has ever flown near Mars in working order was Mariner 4, which came within 6,118 miles in 1965 and radioed back 21 television pictures of a surprisingly moon-like, crater-pocked surface. The Soviet Union has attempted several Mars-bound flights, but all have apparently failed.

Mariner 6's two television cameras are equipped with red, green and blue filters in hopes of enhancing surface details. In addition, they are expected to reveal objects down to 900 feet in diameter, about 10 times as fine as anything Mariner 4 could see.

Scientists expect the spacecraft to concentrate its pictures on the equatorial area of Mars. On March 24, an identical probe, Mariner 7, will be launched to look at the planet's south polar region.

Other instruments on the two spacecraft are designed to analyze gases in the Martian atmosphere, together with their temperature and pressure. The atmosphere of the planet is believed to consist largely of carbon dioxide, and is thought to be so thin that even at the surface it is no more dense than earth's atmosphere at an altitude of 21 miles.

An infrared radiometer has also been included to indicate the Martian surface temperature, which, if lower than minus 253 degrees F., might mean the planet's white polar caps are frozen carbon dioxide. If the surface is warmer than that, the white areas could be frozen water vapor, which would increase the possibility of life.

While the Mariners are providing close-up data, astronomers at JPL and McDonald Observatory will be gathering information from earth. At JPL, a 40-foot-long Coude spectrograph, one of the largest in the world, will make detailed atmospheric analyses. Water vapor has already been identified on Mars in minute quantities; the researchers are seeking to determine whether it appears all around the planet.

At McDonald, an interferometer attached to the observatory's new 108-inch telescope will enable similar studies in the infrared wavelength range.

In the meantime, 38 scientists, divided into teams, will be working on the soft-landing capsule planned for the 1973 Viking mission to Mars. The research groups will study a life-detection experiment, visual photography and thermal imaging, surface sampling, atmospheric profiling, meteorological measurements from the surface, radio propagation, ultraviolet intensity measurements and seismic studies of the planet's internal activity.

The Viking capsule, which will land using a retrorocket system similar to the Surveyor moon vehicles, will be released from a spacecraft in orbit around the planet.

## BREEDER REACTORS

### On the sodium bandwagon

West Germany, struggling to catch up in the nuclear field after a late start imposed by the post-war powers (see p. 246), has decided to concentrate its technological efforts on a concept already widely accepted as the reactor of the future: the sodium-cooled fast breeder.

Minister of Scientific Research Gerhard Stoltenberg announced plans to build a 300-megawatt prototype reactor, and cut off funds from a rival, steam-cooled concept.

Breeder reactors are the next generation of nuclear power generators. Instead of depending almost exclusively on scarce uranium 235 as fuel, as present-day reactors do, they are able to change the much more plentiful U-238, which makes up 99.3 percent of natural uranium, into plutonium fuel.

In the process, breeders generate more heat in their reactor vessels than do non-breeders, and different materials are needed to take off the heat and convert it into steam to drive power-generating turbines. Most present reactors use boiling or pressurized water as coolants.

In addition, breeders need fast-moving neutrons, the particles that cause the uranium atoms to split, while non-breeders must have slower, so-called thermal neutrons. Some coolants, such as water, slow down neutrons, and so are unsatisfactory for breeders.

Sodium has good properties as a coolant in breeders, but it is difficult to handle. An alternative is steam. Germany had a \$150-million steam-cooled project going; that program has now been virtually cut off.

The steam program had been developing from two directions, one using high-pressure and high-temperature steam, the other low pressure and low temperature. Working from those two ends, the optimum combination was being sought.

But according to Dr. Wolf Hafele, head of Project Fast Breeder at the Karlsruhe reactor center, sodium has the best potential for further development—a position shared by the U.S. Atomic Energy Commission. Further work on the steam reactor will be limited to the development of a steam reactor fuel element as a hedge against failure of the sodium project.

Not everyone agrees the decision to abandon steam was wise. Some nuclear engineers feel the steam reactor is the simplest one to make, utilizing materials now available. They think there is considerable danger that the sodium project will fail and that this setback will cost Germany time it can ill afford.