

ASTRONAUTICS

Air-Breathing Space Engine

► THE KIND of engine used in automobiles, airplanes (except jets) and lawnmowers can be developed by 1968 to reach speeds fast enough for orbital flight around the earth, or 25,000 feet per second.

Dr. Theodore von Karman, aerospace pioneer who was in Washington, D. C., to celebrate his 80th birthday, predicted at a news conference that the fuel used for an air-breathing engine at this speed would be liquid hydrogen.

A booster vehicle powered with such an engine would be able to soar around the earth, launch satellites and space vehicles into deep space and then return to earth, ready for another trip.

Today's booster rocket, which usually separates from the satellite at the time of orbit, is wasted and a primitive solution, he said. Booster vehicles that can be recovered would cut costs of space flight considerably.

Dr. von Karman, chairman of the Advisory Group for Aeronautical Research and Development of the North Atlantic Treaty Organization (NATO) and director of International Academy of Astronautics, is one of the world's leading authorities in aerospace science.

The recent United States success in sub-

orbital space flight of astronaut Alan B. Shepard was hailed by Dr. von Karman as proof that the essential problems of space flight have been solved by the United States.

Dr. von Karman predicted that the U. S. would close the missile gap with Russia in three to five years. The U. S. will then have developed missiles and satellites matching Russian missiles in performance.

He urged that the U. S. develop large boosters as well as nuclear rockets for possible flights to the moon.

Dr. von Karman said he does not believe in complete automation. Although the automat can do the easy part of the flight, the part requiring decisions will always need a man.

Directors of U. S. scientific institutions should be scientists, not administrators with a scientific assistant as is now generally the case, Dr. von Karman believes.

His success in the U. S., Dr. von Karman said, stems from the fact that he had a good secondary school education in his native Hungary, and also from the very liberal atmosphere in the U. S., where scientific work is highly esteemed.

• Science News Letter, 79:306 May 20, 1961

METEOROLOGY

Completely Automatic Weather Forecasting

► A COMPLETELY automatic weather forecasting system will definitely become a reality in the near future.

A network of unmanned automatic weather stations scattered across the country will soon be transmitting data into a central computer at the U. S. Weather Bureau's National Meteorological Center in Suitland, Md. The IBM 7090 computer will process the information, then print out weather forecasts for the entire country.

An important step toward this goal will be taken in the next few weeks when the first AMOS IV, a specialized computer that automatically records and stores weather information, is installed at the Worcester Airport, Worcester, Mass.

The present weather observation system is a mixture of meteorologists, weather instruments, volunteer weather observers, and automatic weather observing stations. Twenty-four AMOS III instruments, earlier versions in the Amos series of automatic weather stations, are already proving valuable in helping weather forecasters.

"Within the next two years, all data coming into the Weather Bureau's Meteorological Center from the manned and automatic weather stations will be automatically processed by the 7090 computer for issuing weather forecasts," Frank W. Burnett, assistant director for weather analysis and forecasting, reported.

It is only a question of time before the entire process from the gathering of weather data throughout the country to the final weather forecast will become completely automatic, he emphasized.

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AEROMEDICINE

Astronauts to Hibernate

► SCIENTISTS are now trying to find a way to make men hibernate so they can withstand the acceleration stresses encountered in reaching speeds in space of millions of miles an hour.

Dr. Bernard Black-Schaffer of the University of Cincinnati College of Medicine reported to the American Association of Pathologists and Bacteriologists in Chicago that animals, and eventually man, can tolerate acceleration stresses more easily if they are immersed in fluid-filled bags. To keep them from drowning, he cools the animals to a state of suspended animation in which no breathing is required.

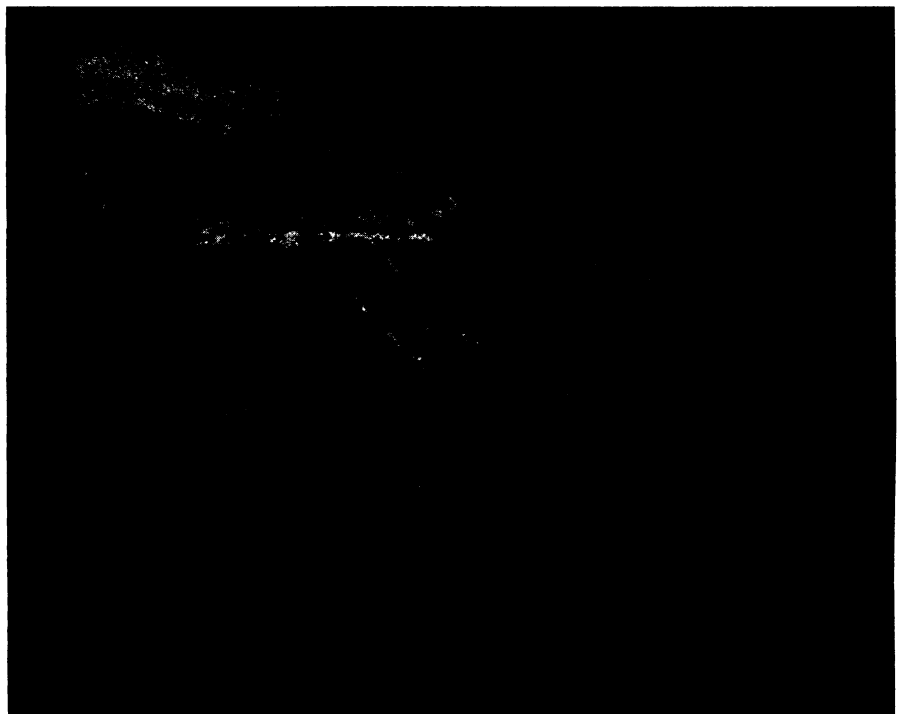
Working under a grant from the National Aeronautics and Space Administration, the agency charged with putting a man in orbit, Dr. Black-Schaffer found that natural hibernators, such as hamsters, can tolerate the effects of acceleration while in the cooled state much more easily than non-hibernators, such as rats. The rats, he said, digest their own stomachs and small intestines under these same conditions, and die of irreversible shock.

It is reasonably certain, the pathologist said, that the hamster's ability to bounce back to normal life results from its being better adapted to suspended animation because it is a natural hibernator.

If he can find a way to protect the rats, turn them into hibernators, the knowledge eventually can be applied to man, not only for survival in massive acceleration but also

in preventing the irreversible and fatal shock produced in man by severe injuries.

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WHAT A BEAUTIFUL VIEW—What astronaut saw from 100 miles up.