

SPACE

Vital Space Plan Killed

► A LEADING PHYSICIST charged that politics and bureaucracy killed a U.S. space program "enormously superior" to the one now being pursued.

Dr. Freeman J. Dyson, professor of physics at the Institute for Advanced Study, Princeton, N.J., identified the project as Orion, a space propulsion system utilizing nuclear explosions set off behind the vehicle. Dr. Dyson expressed his views in *Science* 149:141, 1965.

Orion, which died quietly last January, would have achieved "first generation vehicles," Dr. Dyson reported, that could carry eight men and a payload of 100 tons on "fast trips" to Mars and back. The ships would have been small enough to be lifted into orbit by Saturn chemical rockets. Each would carry a supply of bombs and the machinery for throwing them out at the right place and time for efficient propulsion.

Moreover, "the technical findings of the project have not been seriously challenged by anybody. Its major troubles have been, from the beginning, political. The level of scientific and engineering talent devoted to it was, for a classified project, unusually high."

Historically, the idea for a bomb-propelled spaceship was first described at Los Alamos, N. Mex., in 1955. It took practical shape at the General Atomic Division of General Dynamics Corporation in 1958 "as a direct response to the first Sputniks."

Then, according to Dr. Dyson, the space program skyrocketed. The National Aeronautics and Space Administration was formed, governmental guidelines were developed, and ultimately Orion was "murdered."

SPACE

Magnets Hold Satellite

► SEVEN MAGNETS, one of which is the earth itself, will be used to stabilize a satellite scheduled for launch by the National Aeronautics and Space Administration.

The Atmosphere Explorer Satellite, AE-B, will use the changing forces between four "variable" magnets, two permanent Alnico magnets and the earth's magnetic field to control its rate and direction of spin.

Accurate control of spin rate is important in keeping the satellite stable in its orbit. Changing the direction of spin is done by tilting the satellite's spin axis, and is useful for aiming at different parts of the sky.

The scientists at Johns Hopkins University Applied Physics Laboratory in Silver Spring, Md., Frederick F. Mobley and Robert E. Fischell, were in charge of the system's development. The entire system, said Mr. Mobley, weighs only about 10 or 11 pounds, including the electronic devices that measure the magnetic fields.

The attitude of the satellite will be controlled by a magnetometer that will sense

The physicist lists as the "four murderers" the Defense Department, NASA, promoters of the test-ban treaty, and the scientific community as a whole.

The Defense Department is charged because its "chiefs have been waging for many years a successful battle to stop the U.S. Air Force from embarking upon a great variety of technically interesting projects whose military importance is questionable." Orion was under the wing of the Air Force following the establishment of NASA.

NASA is indicated as placing a search for political stability with reference to its programs first. Dr. Dyson indicates that the spectre of a shipload of atomic bombs exploding and wiping out half of Florida was too much for politically tuned NASA officials to live with even though it would have been "technically easy to make such an accident impossible."

Promoters of the test-ban treaty are guilty because most saw Orion as an Air Force project ostensibly aimed at large-scale military operations in space. Seen from this viewpoint, there were "no qualms" in crushing it.

Finally, the scientific community as a whole is responsible "in a negative sense." Dr. Dyson contends that the vast majority of scientists "have consistently refused to become interested in the technical problems of propulsion."

The death of Orion has significance, in the view of Dr. Dyson, as the "first time in modern history that a major expansion of human technology has been suppressed for political reasons."

• *Science News Letter*, 88:70 July 31, 1965

SPACE

Rough-Burning Rockets Cost Many Millions

► ROCKETS that misbehave and have to be destroyed are costing this country millions of dollars a year.

The key problem is unevenly burning fuel, which causes unpredictable, erratic thrust. The ways in which such "combustion instabilities" develop were outlined in Cloudcroft, N. Mex., by Dr. Frank McClure, chairman of Johns Hopkins University's Applied Physics Research Center.

Eliminating the difficulties is expensive, in terms of both development time and funds, he told the 10th Air Force Office of Science Research. The often-catastrophic oscillations occur when sound waves in the rocket engine cause the burning fuel to vibrate.

Using scale models to pinpoint rough burning before it happens does not work, Dr. McClure said, because the size of the chamber in which the fuel is burned affects the development of instabilities.

• *Science News Letter*, 88:70 July 31, 1965

TECHNOLOGY

New System Simulates Saturn V Liftoff

► AN ENVIRONMENTAL test system to mimic the conditions the Saturn V moon rocket will experience during liftoff is now under construction.

The Saturn V will be subjected to intense vibration caused by the engines and by buffeting of the air. Eight electrodynamic vibration exciters, each rated at 10,000 pounds force, will simulate this vibration to make sure that parts and assemblies in the first stage can withstand these conditions.

The \$800,000 system is being built in New Haven, Conn., by MB Electronics, a division of Textron Electronics, Inc.

• *Science News Letter*, 88:70 July 31, 1965

TECHNOLOGY

Insulation Protects F-111 From High Noise Levels

► INSULATION MATERIAL, Thermoflex Felt, encased in 220 square feet of stainless steel, protects the fuel on the F-111 tactical fighter from engine temperatures that can go as high as 1,000 degrees F.

The Thermoflex will withstand extremely high noise levels without breaking down and losing its insulating capabilities as would conventional fibrous or rigid materials.

The insulation material will also be used as protection for the parachute compartment of the pilot ejection system, and as acoustical isolation for the pilots' compartment.

The material is a product of Johns-Manville, New York.

• *Science News Letter*, 88:70 July 31, 1965