SPACE

Back Seat for Science?

The scientific value of Project Apollo, which plans to place a man on the moon within ten years, is still under question—By Walter Wingo

➤ THE NATIONAL Aeronautics and Space Administration, facing a budget slash in Congress, cannot seem to come up with a good, strong scientific reason for Project Apollo, its effort to put an American on the moon in this decade.

The result has been that a growing number of scientists share former President Eisenhower's view that Project Apollo—oddly named for the Greek god of the sun—is "nuts."

NASA says such an attitude has a familiar ring:

England's King Charles II is said to have "laughed mightily" when he heard scientists at his Royal Society were trying to weigh air;

Columbus had to go to Spain to find backing for his Atlantic voyage;

People lined the river bank to jeer Fulton when he launched his steamboat.

But the American public, its pride hurt by Russian space feats, is generally behind Project Apollo. This time scientists are doing most of the ridiculing.

They claim the $20 to $40 billion moon program is draining scientific and technical people away from more vital projects—such as the fight against cancer, mental disease and hunger.

They complain that the moon program has strayed too far from what it started out being—an adventure in scientific research.

Apollo has become instead simply a race against Russia, with national prestige the prize and scientific benefits just an afterthought, they argue.

Dr. Edward C. Welsh, executive secretary of the National Aeronautics and Space Council, attempted to defend NASA in a speech before the Conference on Space Science and Space Law in Norman, Okla.

He said 42,000 scientists and engineers, or three percent of the national supply, are engaged in the space project. By 1970, he added, the figure will probably rise to six percent.

"The impact is significant, but not overwhelming," he said. "Any constructive program which increases the demand for skilled people is a positive and favorable element in our economy.

"While it takes time to increase the supply, it is axiomatic that such an increase in demand will in turn stimulate an increase in the supply."

He was more vague on direct scientific benefits of Apollo. He spoke in terms of "increased ability and experience in managing major research and development efforts, expansion of capital facilities and encouragement of high standards of quality production."

Even NASA's own scientists have a hard time justifying Apollo as a research program these days. Once, they spoke of the moon as a laboratory for studying such things as earthquakes, minerals and cosmic rays. Now when they speak of the moon, they are mainly interested in how hard a landing field it will make.

Apollo supporters promise a variety of benefits in the form of "fallout"—new ideas for other fields that come as by-products of rocket-making. So far, the NASA program has produced little of that type of fallout.

NASA Administrator James Webb says the real scientific work will be done after we get men on the moon. His critics contend that most of those experiments could be carried out almost as well and much more cheaply with unmanned devices.

Dr. Barry Commoner, biology professor at Washington University in St. Louis, goes a step further. He doubts that there is much on the moon worth studying in the first place.

Most scientists do not agree with Dr. Commoner on that, but they do feel that the U.S. could get more out of research dollars if "retros" were appllied to the man-on-the-moon efforts.

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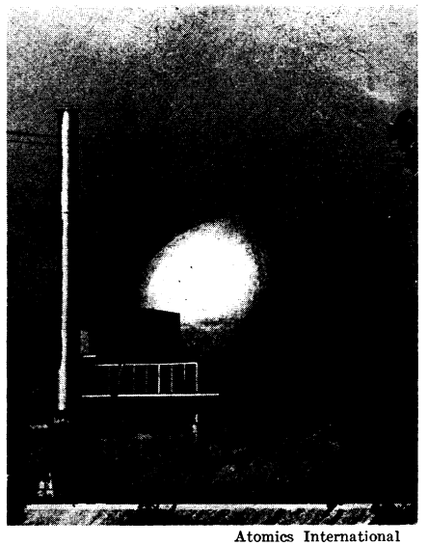

Atomics International

ATOMIC POWER PLANT — This nuclear power reactor built for a commercial utility company is undergoing tests at its Piqua, Ohio, location. The plant was designed and built for the Atomc Energy Commission by Atomics International, Canoga Park, Calif. The city of Piqua will purchase the steam produced by the plant from the AEC.

GEOPHYSICS

Tides in Earth Studied By Columbia Scientists

➤ TIDES, similar to those in the ocean, cause the surface of the earth itself to rise and fall about a foot each day.

These tides and other related motions of the earth's crust are being studied by Columbia University's Lamont Geological Observatory scientists.

For many years, scientists have had questions concerning the motion of the earth's crust, both up and down and back and forth. The motion, which involves stretching and compression of the earth's "skin" as well as the daily rise and fall, is related to many factors. Of primary importance among these is the effect of the ocean's tides, which involve the shifting of billions of tons of water each day, and play a great part in both geological and gravitational phenomena.

The scientists plan to conduct observations throughout a network of earth tidal gravity stations to be set up throughout the eastern United States, and later expanded to include the entire nation and the world.

The first of these stations, which will serve as the main base, has been established in a zinc mine at Ogdensburg, N. J. It is equipped with highly accurate gravity meters and other measuring devices, including a strain seismograph so sensitive that it can detect a shift in the earth's crust of a quarter inch in a distance of seven hundred miles.

The studies are being made by Dr. Maurice Ewing, director of the Lamont Observatory, and co-workers. They are supported by a $75,000 grant from the National Science Foundation.

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ASTRONOMY

Beginning of Planets Sought in "Dust Mice"

➤ THE EARTH, the latest theory goes, began as attractively shaped specks of matter to which other specks clung, forming something like the "dust mice" found under some beds.

The same is true of other planets and the asteroids and comets, according to Dr. Bertram Donn, astronomer for the National Aeronautics and Space Administration, and Dr. Gerald W. Sears, physicist for General Dynamics, Electronics, Rochester, N. Y.

They suggest that the planets began as "whiskers," specks shaped like filaments or thin plates. Such shapes, they said, would be 100 times more likely to cling together than ball-shaped specks.

Studies of the ways crystals form indicate that under high vapor pressure these whiskers would become loose, puffy aggregates which would entrap specks of all shapes.

Thus the conglomerate would grow and gain in density.

Drs. Donn and Sears said the low density of comet nuclei could represent early stages of this process, which they outlined in Science, 140:1208, 1963.

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