SPACE

U.S. Moon Shot Scheduled

The U.S., still in the moon race, plans a Ranger 7 shot at the moon this year, but the payload will be smaller than the Russian shot of April 2—By Ann Ewing

➤ THE U.S. is still in the moon race. Our next shot at the moon is planned for late this year.

Called Ranger 7, its payload will be about 730 pounds, less than a fourth the 3,130 pounds the Russians hurled moonward on April 2. Eight other Ranger shots are scheduled.

U.S. lunar plans also include soft landings on the moon within the next three years, with 12 spacecraft of the Surveyor program. Two versions of Surveyor are scheduled for launch next year.

One will be instrumented to take a look and to sample the lunar surface. The other is to be put into orbit around the moon to take television pictures of the surface as well as make other measurements.

Following these unmanned flights, the U.S. will try landing men on the moon. However, before this goal is reached, the U.S. and Russia may have joined hands in a lunar exploration program, just as they are now embarking on a cooperative effort with their weather satellites.

To attain the skills needed for the lunar trip, U.S. astronauts will train in the two-man Gemini spacecraft, learning how to rendezvous in an orbit in space near earth.

Gemini represents the follow-up program to Mercury, in which three U.S. astronauts have soared successfully around the earth. Gemini flights may last as long as two weeks.

Project Apollo is designed to land men on the moon. The current plan is to use the so-called lunar orbit rendezvous procedure. This means launching three astronauts in an Apollo "mother" craft carrying another spacecraft, the lunar "bug." This would be capable of landing two men on the lunar surface and returning them to the mother craft in lunar orbit. The third man would stay in the orbiting Apollo.

When returned to lunar orbit, the "bug" would be jettisoned and the three spacemen would return to earth in the Apollo, part of which would be left in earth orbit.

The Ranger program for instrument and televised looks at the moon's surface have been so trouble-plagued that Ranger 6 was not flown last February as scheduled. Instead, it was subjected to a rigorous test program aimed at spotting causes of the difficulties with the spacecraft, developed for NASA by the Jet Propulsion Laboratory, Pasadena, Calif.

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Fairchild Controls

HEAD DUMMY—This dummy of the human head is being developed for Project Apollo to provide data to scientists involved in a program to protect astronauts from the hazards of space flight. Designed by Fairchild Controls, it is fully instrumented with gyros, accelerometers, demodulators and an inverter.

BIOPHYSICS

Aging of Space-Traveling Twin Argument Halted

➤ THE HOTLY DEBATED question of a "fountain of youth" in space—whether a space-traveling twin grows old more slowly than his stay-at-home brother—will no longer be argued in Nature.

The problem of how fast clocks tick during travels at speeds approaching that of light was raised by Albert Einstein in 1905 in his first paper on relativity. Since then, scientists have taken positions on both sides.

Most contend that Einstein's theory of slowed ticking was right and that, therefore, time for the twin in the fast-moving spaceship would slow, for both time-keeping and biological clocks. A minority of other scientists have disagreed, often heatedly.

The argument rose to a high point in 1957, shortly before space travel for unmanned vehicles was close to reality, when nearly every week saw a new contention either pro or con. The latest, and last entry, as far as the staid journal Nature, 197:1287, 1963, is concerned, comes from Dr. Max Born of Bad Pyrmont, West Germany, one of the world's outstanding physicists.

He was answering a challenge from Prof. Herbert Dingle of Purley, Surrey, England, who had made his most recent argument against the Einstein theory a "test case for the integrity of scientists."

Dr. Born, who supports Einstein, points out what he believes are the mistakes in Prof. Dingle's arguments against the reality of the clock paradox. With Dr. Born's report and Dr. Dingle's reply, the editor calls a halt, stating flatly that "no further space can be found in Nature for correspondence on this subject."

One test, substituting sub-nuclear particles known as mesons for the hypothetical twin brothers, verified that there is a difference in clock rates between matter at rest and matter in motion.

If heartbeats and other biological clocks follow the same rules of physics as these particles do, then spaceships could provide a "modern-day fountain of youth."

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GEOPHYSICS

Earth's Pressure Said To Cause Magnetism

➤ ENORMOUSLY HIGH pressures upon iron deep in a planet's core causes magnetism, suggests a U.S. physicist who thinks his theory can explain why Venus apparently has no magnetic field.

We should expect no magnetic field on such "light" bodies as Venus, Mars, Mercury and the moon, Dr. Richard J. Weiss reported in Nature, 197:1289, 1963. The recent U.S. rocket probe to Venus, a planet less massive than the earth, indicated it has no magnetic field.

Dr. Weiss, on leave from the U.S. Army Materials Research Agency, Watertown, Mass., is attached to the mathematics department of Imperial College of Science and Technology, London.

He believes all bodies having iron cores and being at least as heavy as the earth could develop enough internal pressure from gravity to become magnetic. This would be expected for Uranus, Neptune, Saturn and Jupiter, he says.

High pressure, he explains, could squeeze upon two electrons in an iron atom and make them hop to higher levels. The iron then takes on a "new phase," which is magnetic. Scientists are developing ways of creating pressures equaling those thought to be in the earth's center, he said.

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GEOPHYSICS

Meteorite or Asteroid Impacts Cause Tektites

➤ TEKTITES are produced as splashes of fused material from terrestrial craters formed by impact with a meteorite or asteroid, Dr. Gerald S. Hawkins, director of the Boston University Observatory, has concluded.

Dr. Hawkins' conclusion agrees with that of many other scientists who support the earth theory of the origin of tektites. He believes that meteorites or asteroids crashed into the earth with such an impact that huge craters, 6 to 40 miles wide, were created and splashes of fused material were sent up and out over distances of 2,000 miles or more at terrific speeds.

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