did little and soon became dormant.)

Despite Doering's refusal to support Humphrey, his office received a letter on 2 August stating that his name would appear shortly in an advertisement in the New York *Times* listing "Professors for Humphrey" unless he notified the Humphrey camp otherwise. Doering was out of the country, but his secretary called the Humphrey camp and suggested that Doering's name be dropped. She was informed that Humphrey aides had been in touch with Doering and had cleared the use of his name. Actually, no one had contacted Doering. The ad appeared (with Doering's name misspelled), and Doering forced the Humphrey camp to run a retraction ad in the *Times*. A somewhat similar experience befell Felix Bloch, the Stanford Nobelist, who also declined Humphrey's invitation but then found his name listed in the ad and subsequently won a retraction. The Humphrey ad even listed a man long dead. Bloch is the Max H. Stein professor of physics at Stanford and—you guessed it—the Humphrey camp managed somehow to list Stein's name as a supporter.

The Humphrey campaign has also been embarrassed by mind-changing on the part of eminent scientists. Philip Handler, chairman of the National Science Board, first agreed to be listed as a Humphrey organizer, then backed out on the grounds that scientists should not involve their profession in partisan politics. Similarly, the Humphreyites on 15 September sent out telegrams claiming the support of Princeton Nobelist Eugene Wigner, among others, only to have Wigner dissociate himself from the campaign.

There seem to be major differences in the campaign themes stressed by the Nixon and Humphrey camps. The Nixon group, in its first press release, blamed the present budget crunch in research on the Johnson-Humphrey administration and asserted that the Eisenhower-Nixon administration had seen "eight years of scientific growth." The Humphrey group's first press release, on the other hand, largely ignored the bread-and-butter issue and stressed the belief that Humphrey and Muskie offer the best chance for nuclear peace and domestic tranquility.

The difference between the two camps seems particularly great on military matters. Nixon has stressed the importance of science in developing new weapons and has blamed the Johnson-Humphrey administration for "risking the opening of a research gap" with the Soviet Union. Humphrey, on the other hand, has emphasized his record on arms control, including his support of the nuclear test ban and nuclear nonproliferation treaties. James Reston, New York *Times* columnist, asserted last week that "the most important single difference" between Nixon and Humphrey "is in the field of arms control"; and the *Times* endorsed Humphrey for President, citing his arms control record as a prime reason. Many of Humphrey's scientific backers say they were attracted by his efforts to curb nuclear weapons.

The Nixon and Humphrey groups will apparently play somewhat different roles in the campaign. The Strauss committee seems to have no plans to raise money or conduct an especially vigorous campaign. The Humphrey camp, on the other hand, is urging its Scientists and Engineers group to raise money for advertising and to campaign at the local level. Humphrey has also set up a separate panel of eight scientists, headed by Wiesner, to advise him on technical matters,† while Nixon has established no formal science advisory apparatus.

The impression one gets is that Humphrey has spent considerably more effort in courting the scientific community than has Nixon. Whether such support will make any difference to Humphrey's lagging campaign is another question.—PHILIP M. BOFFEY

† Besides Wiesner, the advisory group includes: Thomas Malone, Emanuel Piore, Roger Revelle, David Z. Robinson, Harvey Sapolsky, Athelstan Spilhaus, and Chauncey Starr.

# The Soviet Union's Zond 5: Is It Also a Planetary Spacecraft?

Since the end of the mission of the Soviet Union's Zond 5 spacecraft on 21 September, U.S. observers have interpreted Zond 5 as being an unmanned precursor of a manned lunar mission. While we agree with that specific view, we feel that there is strong evidence that Zond 5 is also a precursor of an unmanned planetary mission of much greater capability than has been heretofore believed possible.

It is obvious also that a new, larger launch vehicle is now being used for lunar flights. Presumably this is the "Proton"-class system predicted in 1966 [*Science* **151**, 945 (1966)].

The most striking evidence for the unmanned-planetary-mission interpretation comes from the official Soviet report which emphasized that Zond 5 is a major advance in space technology relevant to planetary exploration:

> . . . However, none of these automatic apparatus* was brought back to earth, since at that stage of development, space technology was not able to cope with this task. The scientific information that was obtained was transmitted from the apparatus via radiotelemetry channels. However, no matter how perfect radiotelemetry and television may be for transmitting information, their capability is to some extent limited. Moreover, some of the information obtained by the scientific apparatus could not be analyzed on board the space apparatus.
>
> The development of space technology presents scientists with ever more complex problems in the investigation of interplanetary space and the planets of the solar system.
>
> An urgent solution is now needed for such problems as studying the surface and crust of the planets and the composition of their chemical elements and minerals, and searching for traces of living organisms.
>
> There is likewise great scientific interest in receiving firsthand photographs of the surface and radiation spectra of the heavenly bodies, free of the encumbrances and distortion of telemetric transmission.
>
> Therefore, the further development of Cosmonautics has placed on the agenda the question of delivering information from space directly to the scientists' laboratories. This assignment of developing the means and methods for returning space devices from interplanetary trips was given the Soviet space ship "Zond-5" and was successfully completed.

(The above quotation is from an article by Professor A. Dmitriyev, reported in both *Red Star* and *Pravda* on 25 September 1968.)

Additional evidence of the relationship

* The phrase "these automatic apparatus" refers to all previous Soviet lunar and planetary spacecraft.

of the Zond 5 spacecraft to unmanned planetary flights comes from the description of the spacecraft in the same article, and from the drawing that accompanies the article. For example, the spacecraft is reported to have solar power unlike that of any other lunar probes so far launched. The drawing shows large solar panels of the same general configuration as those of planetary spacecraft of the Mars 1, Zond 3, Venus 2, Venus 3, and Venus 4 type. Indeed, the overall configuration is very similar to that of Venus 4 except that Zond 5 is much larger.

The spherical compartment presumably used for manned reentry is located at one end, as was the spherical capsule of Venus 4, and the midcourse motor is at the opposite end of the cylindrical spacecraft body. Housekeeping functions are carried out in the middle section (the "orbital compartment" of the previous planetary spacecraft). In addition, Zond 5 is shown with a very large high-gain antenna mounted on one side of the middle of the cylinder, parallel with the solar panel, as is the case in all previous planetary spacecraft. Indeed, the antenna shown seems unnecessarily large for any lunar mission.

Thus, the Soviet descriptions of the Zond 5 not only state that it is a precursor to their next step in unmanned planetary exploration but supply technical details which support that view.

In conclusion, we make these points:

1) Testing of the Zond 5 system at this time suggests that the Soviets may intend to launch such a system at the coming Mars launch opportunity, in late February or early March 1969.

2) The Soviet news release of 25 September suggests that Zond 5 had a recoverable film system for procuring lunar photographs. The Luna 3, Zond 3, and Luna 12 film-readout system was not improved significantly between 1959 (Luna 3) and 1967 (Luna 12). The Soviets need a new and better photographic system. Thus, we speculate that they may be planning a flyby-and-return mission to Mars with film recovery.

3) The Soviets have previously attemped to launch both an entry-capsule spacecraft and a photographic flyby at a single planetary launch opportunity (that is, Venus 2 and Venus 3). Hence, we suggest that it is possible that they plan to launch two systems of the Zond 5 class during the coming winter, one a survivable lander system, possibly with a relay satellite, and the other a flyby-and-return mission with film recovery.

4) Finally, we point out that the Dmitriyev article specifically mentions the need for recovery in the context of studies of chemical composition and search for evidences of life. Dmitriyev's statement implies that the Zond 5 recovery technique may be a significant step in the development of an unmanned sample return system for use in lunar and planetary flights.

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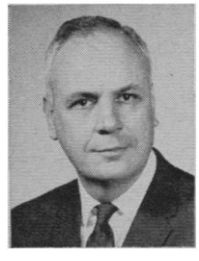
# APPOINTMENTS

F. J. Weyl



K. E. Grant

**F. Joachim Weyl**, special assistant to the president of the National Academy of Sciences and former chief scientist for the Office of Naval Research, to dean of sciences and mathematics at Hunter College. . . . **Kenneth E. Grant**, associate administrator of the Soil Conservation Service of the Department of Agriculture, to administrator of the service; he succeeds **Donald A. Williams** who will become program adviser on water management and development for the Ford Foundation in India. . . . **Warren S. McCulloch**, a senior staff member of the M.I.T. Research Laboratory of Electronics, to president of the American Society for Cybernetics. . . . **C. Robert Wieser**, deputy director of M.I.T. Lincoln Laboratory is taking leave of absence to become assistant director of Defense Research and Engineering in the office of the Secretary of Defense. . . . **Thomas G. Bowery**, associate director for operations of the Division of Research Facilities and Resources, National Institutes of Health, to acting director of the division; also at NIH, **Shiela C. Mitchell**, a medical officer in the epidemiology and biometrics program of the National Heart Institute, to assistant to the director of the institute. . . . **Theodore R. Fick**, an administrator in the Boston Naval Shipyard, to director of the Naval Radiological Defense Laboratory. . . . **William H. McLean**, secretary of Stevens Institute of Technology and secretary of the Board of Trustees, to dean of the college and professor of management science; also at Stevens, **Preston R. Clement**, dean of the faculty, to provost of the college. . . . **Raymond L. Bisplinghoff**, head of the department of aeronautics and astronautics at M.I.T., to dean of the M.I.T. school of engineering. . . . **Everett M. Hafner**, professor of physics at the University of Rochester, to dean of the school of natural science at Hampshire College. . . . **H. Edwin Young**, vice president of the University of Wisconsin, Madison campus, to chancellor of the university. . . . **Robert G. Lindee**, assistant dean for administration and assistant to the vice president for medical affairs at Stanford University School of Medicine, to associate dean for administration at the school. . . . **William T. Driscoll**, professor of zoology at the University of Denver, to associate dean of the university's College of Arts and Sciences. . . . **E. B. Howard**, assistant executive vice president of American Medical Association, to acting executive vice president of the association.

# RECENT DEATHS

**Dinsmore Alter**, 80; former director of the Griffith Planetarium in Los Angeles and former chairman of the department of astronomy at the University of Kansas; 20 September.

**Lawrence K. Frank**, 77; former director of the Caroline Zachry Institute of Human Development; 23 September.

**Francis J. Gerst**, 86; former dean of the graduate school and chairman of the department of medicine at Loyola University in Chicago; 30 September.

**Louis Long**, 57; associate dean of students and head of the division of evaluation, research and testing at the City College, The City University of New York; 12 September.

**Edward O. Norris**, 67; a vice president of the Gyromat Corporation and one of the workers on the first atomic bomb; 19 September.

**Robert L. Usinger**, 55; professor of entomology at the University of California, San Francisco; 30 September.