The Boosting of the Planets

Space Technology and Planetary Astronomy. JOSEPH N. TATAREWICZ. Indiana University Press, Bloomington, IN, 1990. xviii, 190 pp., illus. $29.95. Science, Technology, and Society.

Recent events in space policy make *Space Technology and Planetary Astronomy* especially interesting. With a presidential panel suggesting that the National Aeronautics and Space Administration renew its emphasis on unmanned space science, this history of politics, technology, and science will be useful to practitioners and concerned observers. If nothing else, the book warns space scientists to be extremely wary of the political nature of the research they pursue and of the institutions that promise support. As planetary astronomers learned in the 1960s and 1970s, support for their activities waxes and wanes depending on the strength and direction of political forces and institutional needs.

As the author forewarns, this history of planetary astronomy lacks a theoretical framework such as academics in science and technology studies appreciate. Instead, the book takes a narrative approach and recounts the rejuvenation of planetary science as a result of the United States' efforts to win international prestige and technological supremacy after the Russian launch of the Sputnik satellite in 1957. It begins with a discussion of the severe erosion of prestige and support for planetary astronomy early in the 20th century, when traditional astronomers seemed to have run into a roadblock concerning both observation and theory. Ground-based studies of planets were limited by technology, and theories of planetary origin remained highly speculative. The debate about the existence of canals on Mars and the red planet's habitability did little to make planetary astronomy popular among other professional astronomers. Meanwhile, new techniques and approaches to stellar and galactic astronomy made these nonplanetary fields exciting by providing fascinating avenues for studying the origin and development of the universe. In an age of astrophysics, planetary observations seemed mundane and irrelevant.

Though some military interest in the planets emerged after World War II—for learning about weather patterns elsewhere that might help explain the earth's, and for developing techniques to help distinguish missiles from meteors—planetary astronomy gained its major impetus from the new space program established in 1958. As NASA administrators strove to develop manned and unmanned programs, they realized that much remedial scientific work needed to be done regarding the moon and planets. This need contributed to the creation of alliances within NASA and the National Science Foundation to support ground-based astronomical studies. Such support even included funding to build ground-based facilities for planetary astronomers. Though it caused some grief to administrators, who had to justify to Congressional investigators why the space agency should build telescopes on the ground, NASA funding for such programs peaked at almost $6 million in 1966. But as the Apollo manned lunar landing program fell from grace once the initial objectives of reaching the moon were achieved in 1969, so did support for planetary astronomy (as well as for most other fields of space science). The planetary program in the early 1970s achieved a modest level of stability, but even that stability dissolved late in the decade and into the 1980s. So went the enthusiasm for this rejuvenated field of science.

Space Technology and Planetary Astronomy best suits readers who have some familiarity with the basic history of the space program. The author introduces scores of participants without providing even thumbnail biographies of them, so an unknowing reader might not appreciate why some people are more significant than others. In addition, readers should beware that the book is more about ground-based planetary astronomers and their institutional and political struggles than about the physicists, geologists, and members of other disciplines who explored the planets vicariously with instruments carried by space probes.

Even with these limitations, the book reminds us of an important lesson in the postwar era of big science: that government policy may lead initially to tremendous support for various fields of science and technology. This enthusiastic support often leads to an implicit social contract of continued future support between the government and practitioners. Such a contract, however, is easily broken as government policy changes—for example, when the political urgency of demonstrating technical supremacy over an ideological foe no longer seems so important in a Vietnam War–weary America. This lesson will be learned repeatedly as government policymakers commit and withdraw resources for both military ("Star Wars" weapons) and civilian (the Superconducting Super Collider) research efforts. Practitioners beware!

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Institutional Arrangements

The Kaiser's Chemists. Science and Modernization in Imperial Germany. JEFFREY ALLAN JOHNSON. University of North Carolina Press, Chapel Hill, 1990. xii, 279 pp., illus. $39.95.

In 1905 Emil Fischer, Walther Nernst, and Wilhelm Ostwald proposed an Imperial Institute for Chemistry to solve mutual problems. These disciplinary leaders hoped to link pure and applied science by building new relationships between science and industry. Like many of their colleagues, they found balancing research and teaching frustrating. They also hoped to find support for fields neglected in Germany such as inorganic, physical, and analytic chemistry. Since the existing academic system would not accommodate these needs, the three sought

Emil Fischer in his laboratory, 1905." [From *The Kaiser's Chemists;* Max-Planck-Gesellschaft Photo Archive]