

BOOKS

Cometary Science and Cometary Lore; Even Halley and Newton Were of Their Time

Comets, Popular Culture and the Birth of Modern Cosmology

▶ Sara Schechner Genuth
Princeton U. P., Princeton, N.J.,
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Reviewed by Michael J. Crowe

Not only has the decade of the 1990s been rich in the number of noteworthy comets that have blazed into view, there have also appeared two richly detailed historical studies of cometary science. In 1991, astronomer Donald Yeomans brought out his *Comets: A Chronological History of Observation, Science, Myth and Folklore* (Wiley). As its title suggests, the book surveys cometary observation and theory from antiquity to the present and also gives some attention to the place of cometary lore and science in civilization. Now, historian of science Sara Schechner Genuth, in *Comets, Popular Culture and the Birth of Modern Cosmology*, has advanced the frontier of historical research.

After surveying scientific, religious and popular beliefs about comets in the period before the scientific revolution, Schechner Genuth's book concentrates on 17th- and 18th-century ideas and beliefs about these spectacular astronomical objects. The traditional account of the development of cometary science in these two centuries centers on how Isaac Newton and Edmond Halley first brought comets under the sway of science—Newton by showing that comets move in conic sections and Halley by demonstrating that at least some comets are periodic.

Without denying the scientific contributions made by these two giants, the tale told in this volume turns out to be far richer and more nuanced than one might expect. One sees that New-

ton and Halley, rather than viewing cometary science as irrelevant to religion and to astrological claims about comets as harbingers of destruction or foretellers of prosperity, were themselves intent on deciphering God's use of comets for the creation, alteration or destruction of worlds. Halley, for example, sought to explain the biblical deluge and to describe the final conflagration as caused by comets hurtling toward Earth.

Halley's master, Newton, went still further. For example, he formulated a theory that comets play a role in the divine economy by transporting and depositing fluids onto the planets and suns. Moreover, in various writings, not all published, Newton "intimated that comets were divine agents destined to reconstitute the entire solar system, to prepare sites for new creations, and to usher in the Millennium," writes Schechner Genuth. Readers unaware of the scriptural, alchemical and metaphysical aspects of Newton's thought uncovered by scholars in recent decades should find the chapter on Newton a revelation.

Schechner Genuth sets the stage for her discussions of Newton and Halley by describing how, during the 17th century, educated persons came to disparage the traditional divinatory aspects of comets, not simply for scientific reasons but also because they disliked the political, social or religious purposes various authors associated with comets. And she traces the same blending of scientific with religious, teleological and apocalyptic concerns exhibited by Newton and Halley in a variety of Enlightenment Newtonians, including William Whiston, Thomas Wright, Johann Lambert, Immanuel Kant, William Herschel and Pierre Simon Laplace. Gradually, such approaches fell from favor in the scientific community. She cites writings from the 1830s by the astronomer François Arago to indicate that, by then, such studies had become outmoded.

This is a thoroughly researched and fully documented book supplemented by an extensive bibliography and a useful index. It is a work of serious scholarship that is rich in fascinating material. It recreates a world that has now largely but not entirely passed away, and it thereby shows that differ-

ent ages have assigned comets diverse and dramatic roles. Judiciously selected quotations and 53 illustrations, some exceptionally striking, add to the pleasure of reading this very engaging story, which is filled with surprises, ironies and fresh insights.

Bombshell: The Secret Story of America's Unknown Atomic Spy Conspiracy

▶ Joseph Albright
and Marcia Kunstel
Times Books (Random House),
New York, 1997. 399 pp. \$25.00
hc ISBN 0-8129-2861-X

We have known of atomic espionage almost as long as we have known of the atomic bomb itself. Within a decade of Hiroshima and Nagasaki, Klaus Fuchs, Alan Nunn May, Julius and Ethel Rosenberg, David Greenglass and Harry Gold had been identified, tried and convicted as spies for the Soviet Union. Indeed, the judge in the Rosenberg trial maintained, as he condemned them to death, that their actions had brought World War III closer.

The embodiment of evil seems clear. Try now to see the situation from a different perspective: Capitalism had flung the United States into the Great Depression, and it took World War II to enable the nation to climb out of its hole. Might not the economy falter again after the war in the hands of the capitalists, who might once more look to war to restore economic vigor? With the invention of nuclear weapons, the carnage would be awesome. World peace and stability thus mandated that nuclear weapons be acquired as soon as possible by the Soviet Union, the likely adversary of the US.

This was the thinking of Theodore Alvin Hall, the only known American scientist to assist the USSR in creating its copy of the Manhattan Project. Born in 1925 Hall was a precocious New York City youth who found the ideals of socialism and communism attractive and who thought that they were being successfully implemented in the Soviet Union. After two years

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