# BOOK REVIEWS

## Close Encounters

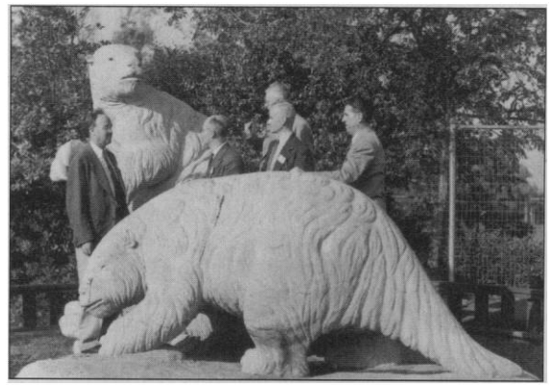
**Redeeming Culture.** American Religion in an Age of Science. JAMES GILBERT. University of Chicago Press, Chicago, 1997. x, 407 pp., illus. $28.95 or £23.25. ISBN 0-226-29320-3.

In 1962, the city of Seattle presented its dramatic world's fair, Century 21, a celebration of science and technology. Planners designated Area III to house the space exhibit. Principal science adviser Donald Menzel wanted to display a full-scale model of a rocket designed for travel to the moon. Next to it he would have a large hemispherical model of the moon. Menzel, however, met resistance to this idea and soon lost control of the planning process. Eventually, the fair would have a dazzling film about space travel and employ the services of Fine Arts Productions for the project. Hollywood writers came in to provide the script for the film. Then architect Minoru Yamasaki designed a building for the "Spacearium." It immediately acquired the name "space Gothic," as it bestowed on the space project the soaring symbolism of religious spirituality. When the fair opened, there stood across from the exhibit the Christian Witness pavilion. The Christian Witness people had wanted this site specifically. As the fair celebrated science and technology, this building would remind people that God also abides. Furthermore, it would provide a different interpretation of the future from that offered by the scientific displays and narratives inside the space building.


"The savants of the American Association for the Advancement of Science greet their surprise new member," William Jennings Bryan, who "on 30 December 1924 . . . paid his five dollars to join," designating section D (astronomy) "as his chosen area of specialization." The announcement of his affiliation interrupted the AAAS annual meeting that year, which had featured a refutation of his position on evolution. [From *Redeeming Culture*; cartoon by Clifford Berryman, *Washington Star*, 4 January 1925]

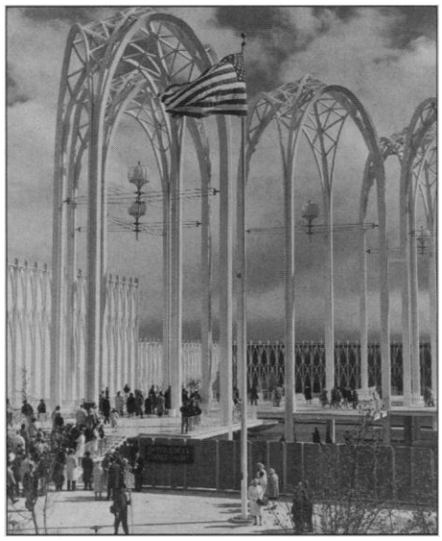
The Seattle Fair is one of the several examples that James Gilbert sets forth in order to demonstrate a powerful feature of American culture—the dialogue between religion and science. The book abounds with fascinating cases in point. Gilbert, an accomplished scholar in American intellectual and cultural history, has not only an informing peripheral vision for his subject but an interpretative touch that enhances his chapter essays. Gilbert reviews the American scene from the 1920s through the early 1960s and offers episodic accounts of selected cultural exchanges between religion and science. His excursions into this subject revisit such blockbuster events as the Scopes trial, still remembered, and Immanuel Velikovsky's best-selling book of 1950, *Worlds in Collision*, now largely forgotten. He makes some visits to the intellectual community, but mostly public culture and public life claim the foreground. In another chapter, he explores the United States Air Force's promotion of the film *God of Creation*, produced in 1946 by the Moody Institute of Science. The work of the zealous Irwin Moon, the film expressed its creator's faith that the Bible and the book of nature do not disagree, and Moon devised a spectacular, high-tech mode of presentation to make that point. Reconciliation and accommodation between science and religion are the dominant motif here, and these efforts bring in a variety of personalities. Film-maker Frank Capra (better known to American audiences through such landmarks as *It's A Wonderful Life*) made three films for CBS television, including *Our Mr. Sun*. Rocket scientist Wernher Von Braun habitually invoked religious language in describing the ambitions of the space program; he even supported Ronald Reagan in his preference for teaching creation science in the California public schools.

Although on occasion Gilbert raises questions about the religion-science dialogue, he generally finds it a healthy part of American culture, each component a useful and important tradition learning from the other and providing a viable narrative theme for American public culture. Against Gilbert's more celebratory mood, I find his study rather disturbing. First, the concepts of the subtitle, "religion in an age of science," should, I believe, be reversed. For the recurring phenomenon in these pages is what happens to scientific thought as it encounters a culture in which religious faith and theistic preference are established and powerful. Gilbert assumes rather than demonstrates that the decades under consideration represented an age of science. But in many quarters of American intellectual life the pragmatist standards of the scientific method were meeting severe judgment. And as in Seattle, where the religiously concerned kept their vigilance, so elsewhere they wanted to be certain that *they*, not necessarily the scientific community itself, processed scientific ideas and integrated them into American culture.



"Members of the American Scientific Affiliation . . . visit the La Brea tar pits in Los Angeles during [their] 1949 convention. The giant extinct sloths modeled here presented the sort of evidence that intrigued and divided the organization," which under the auspices of the Moody Bible Institute had been "designed to reconcile religion and science—or better, professed religion and the profession of scientist." [From *Redeeming Culture*; courtesy of the Wheaton College Archives and Special Collections]

Second, an important subtheme in Gilbert's study is the matter of democracy in the science-religion conversation. Beginning with a most suggestive essay on the Scopes trial, Gilbert shows how religious-minded individuals mistrusted any science



"Space Gothic in Seattle: the graceful arches of the United States Science Pavilion" at the 1962 World's Fair. [From *Redeeming Culture*; courtesy of United States Archives—Pacific Northwest Branch]

that appeared remote from the common sense and intuitive wisdom of the American people. William Jennings Bryan thus considered himself as much a "scientist" as anyone else. Just as the ordinary individual could read and learn from Scripture by himself, he believed, so could that individual understand science. And as in religion, the danger occurred when an elitist group of theorists sought to impose its esoteric doctrine (such as evolution) against the conventional wisdom of the shared culture of a given society. Today Bryan may appear more a curiosity than a representative voice. However, amid the great success of his *Worlds in Collision*, Velikovsky inveighed against scientists' refusal to take the book seriously (he had a theory that a comet struck the Earth around 1475 B.C., raining rocks on Joshua's enemies and wrenching the Earth from its orbit, thus "stopping" the sun). Velikovsky, comparing himself to the maligned Copernicus, accused scientists of becoming dogmatic and giving loyalty to a particular truth system, as in the Soviet Union. He appealed to the jury of democracy as the fairer test of his ideas and faulted elite institutions like Harvard University and the American Association for the Advancement of Science. Gilbert's book, therefore, should give us pause. Our contemporary populist culture reverberates with anti-elitism. Surely the interests of science do not stand to gain from it.

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# Galactic Reflections

**Bright Galaxies, Dark Matters**. VERA RUBIN. AIP Press (Springer-Verlag), New York, 1996. xvi, 236 pp., illus., + plates. $29.95 or £22.95. ISBN 1-56396-231-4. Masters of Modern Physics.

As understanding the evolution and ultimate fate of the universe is a major goal for astronomers, it is sobering to recall that it is only in the 20th century that we have learned the nature of galaxies. By the late 1800s the Herschels had found many "spiral nebulae," but it was not until the 1920s that Edwin Hubble identified these objects as "island universes" containing billions of stars quite separate from our own Milky Way. He went on to show that these galaxies are expanding away from each other in what we now call the Hubble Flow.

Today a wealth of information about the lumpy distribution, range of luminosities, dynamics, and masses of galaxies is available. They can no longer be thought of as "island universes" but rather are known to be dynamic, often interacting systems. We now know that galaxies and the clusters in which they reside contain not only the luminous matter that early observers studied but that the vast majority of mass lies in the form of dark matter whose nature is not yet understood. In spite of extensive observational and theoretical work during the last 50 years, we still do not know enough about the distribution of this matter and the properties of the expansion to know whether the universe will expand forever or collapse back on itself.

It is galaxies and what their dynamics can tell us about the universe that have fascinated Vera Rubin throughout her career. From observations of stellar motions in the nearby Andromeda Galaxy (M31) to investigations of the large-scale motion of the local supercluster, Rubin's work has been centered on stellar motions in galaxies and the evidence that they provide showing that most of the matter in the universe is dark.

*Bright Galaxies, Dark Matters* is a collection of some of Rubin's papers, popular articles, and talks, connected by brief remembrances placing them in context.

The first group of papers, Galaxies, ranges from presentations at professional conferences to articles from semi-popular science magazines and even an after-dinner talk presented to an amateur astronomy group. Although Rubin writes very clearly, many of these papers are fairly technical and would be challenging for the general reader.

Tools of the Trade: Telescopes, a Catalog, and Some Maps covers a wide range of topics from the Hubble Space Telescope to how Andrew Carnegie and George Ellery Hale established Mt. Wilson Observatory with its giant (by 1910 standards) 100-inch (250-cm) telescope. Rubin's broad knowledge of astronomical history emerges throughout the book and helps to set the background for many of her topics. My favorite essay is the beautifully written "Letter from Chile" describing an observing trip in 1971 to Cerro Tololo Inter-American Observatory. For those of us who have observed there, the letter brings back a flood of pleasant memories, but anyone will enjoy Rubin's description of the Chilean countryside and the spectacular view of the Milky Way from a dark site high in the Andes Mountains.

Matter and Motion contains papers mainly from scientific meetings on the overall theme of the distribution of matter and evidence that most of it is unseen. Included is Rubin's 1995 Russell Lecture (representing the highest award of the American Astronomical Society), a wonderfully clear historical account of what we have learned over the past hundred years about galaxies by examining their spectra and what mysteries are yet to be solved.

*Bright Galaxies, Dark Matter* culminates with a very personal look at the author's life as an astronomer. She includes a few brief biographies of scientists who have influenced her, an interview done for *Mercury* magazine about her "unconventional career," and several vignettes about women in science and the difficulties they face.

Each section of the book is preceded by a brief account of when and where the essays were presented. I found myself continually referring back to these introductions and wished the accounts had been placed with the individual essays. A summary of our understanding of the problem at the time when each essay was written might have been particularly valuable to a general reader. Placing the technical essays in chronological order would also have been helpful.

This collection of essays enables one to follow the evolution of Rubin's ideas about dark matter as the observational evidence mounts. Her presentation of the historical background, often overlooked by other writers, is particularly enlightening. Overall, this is a rich and varied book in which Rubin's love of astronomy and the natural world shines brightly.

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