[Review of the book *Looking for Earth: The Race to Find New Solar Systems*]

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Doel, Ronald E.
Department of History (and Department of Geosciences), Oregon State University
*Reviewing Author

A bitter edge leads Stern's straightforward prose. His scientists and technologists quoted classical authors as well as modern philosophers, and they certainly spoke freely about big issues that concerned ordinary people, but artists and writers sensed more clearly "the shakiness and hypocrisy of the established, repressive order" and gave voice to "an intuition of some coming cataclysm" (pp. 202–203). Stern's depiction of flawed character (encomium is reserved only for Weizmann, whose personal life escapes scrutiny) is unsettling for scholars with family responsibility who wake every morning in the provincial academic setting devastatingly portrayed by Max Weber (p. 73) to wonder how they will make ends meet while still generating works of inspiration.

LEWIS PYENSON

M. Mladjenović. *The Defining Years of Nuclear Physics: 1932–1960s.* xx + 442 pp., figs., tables, indexes. Bristol, England/Philadelphia: Institute of Physics, 1998. $150, £85.

In this book M. Mladjenović documents the major developments in the three great decades of nuclear physics. Mladjenović offers his readers a sense of the scope of these developments primarily by presenting condensed versions of a selection of original publications. He has organized his material into four parts (and twenty chapters) under the following headings: "From the Discovery of the Neutron to Nuclear Fission," "Nuclear Instruments," "Nuclear Models," and "Nuclear Reactions." Part 1 covers discoveries up to 1940 (neutron, positron, β^+-radioactivity, etc.); Part 2 deals with nuclear accelerators (up to the large proton synchrotrons of the late 1950s), the various counter methods used in nuclear physics, and the properties of gamma decay, internal conversion, and beta decay processes. Part 3 reviews the nuclear models (shell, collective, individual-particle), and Part 4 concentrates on observed nuclear reactions and the theoretical models created to describe them.

Mladjenović's presentation of the original publications, supported occasionally by a few later statements of their authors, provides access to one of the most important (if not *the* most important) areas of physical research in the second third of the twentieth century. His book addresses scientists, although not only the narrow community of nuclear physicists, and its contents offer an authentic record of the ferment of intellectual and creative activity that marked the advances in this field. Mladjenović, however, does not attempt to present a complete or balanced history of nuclear physics. His arrangement of the text according to topics standard for scientific review papers often tends to obliterate the genuine historical connections between nuclear physics and neighboring fields, especially elementary particle and cosmic-ray physics. Thus, for example, Hideki Yukawa's meson theory, of central importance to an understanding of nuclear forces, is mentioned only once, in passing. On the formal side, apart from the publications Mladjenović has not used any firsthand sources such as letters and manuscripts.

Despite these limitations, interested historians of science will welcome Mladjenović's work for its clear and systematic organization of the topics it highlights. And they should be able to make good use of it in formulating their own accounts of a subject that, because of the promises and dangers the application of nuclear physics holds for daily life, has both fascinated and terrified people for many decades.

HELMUT RECHENBERG

Alan Boss. *Looking for Earth: The Race to Find New Solar Systems.* xii + 240 pp., illus., figs., app., bibl., index. New York/Chichester, England: John Wiley & Sons, 1998. $27.95, Can $39.50.

In 1935 Henry Norris Russell, America's most eminent astronomer, declared that the origin of the solar system posed "the greatest unsolved problem in astronomy." A major challenge he and fellow astronomers faced was determining whether the solar system was a unique, isolated occurrence or one instance of a phenomenon common throughout the stellar realm. Efforts to discover remote planetary systems yielded only false hopes through much of the twentieth century. But in 1995 a pair of Swiss researchers based at the Geneva Observatory identified a planet roughly half the size of Jupiter orbiting the star 51 Pegasi. In more recent years the number and variety of known planetary systems has greatly multiplied, reinvigorating debates over the plurality of worlds and the likelihood of life elsewhere in the universe.

The quest by astrophysicists to discover extrasolar worlds is the subject of Alan Boss's account. An astrophysicist at the Carnegie Institution of Washington, Boss himself took part in this search, and he uses his familiarity with the personalities, institutions, and instruments of contemporary astrophysics to provide a fast-paced, journalistic narrative of the international

race to discover remote planetary systems. He addresses not only significant technical issues that shaped these discoveries (including the requirement of distinguishing planets from very low-mass, low-luminosity stars known as brown dwarfs) but also their professional and disciplinary contexts. Heated debates at Woods Hole summer institutes for astrophysics and political squabbling over funding for the search for extraterrestrial intelligence are no less part of his story than controversies over new techniques in spectrometry and priority disputes among his colleagues.

Boss begins with a recounting of efforts by astronomers to discover extrasolar planets from the nineteenth century forward, including the decades-long attempts by Peter van de Kamp of Swarthmore College to discover them by measuring tiny astrometric wobbles in the motions of nearby stars. His terse overview of cosmogonal research through the 1970s, while generally accurate, lacks historical sensitivity, and his story is marred by occasional minor errors. Russell receives credit for conclusively demonstrating a fundamental flaw in collisional cosmogony schemes in the mid 1930s, though in fact this critical result was achieved later by Lyman J. Spitzer, Russell's former graduate student; important cosmogonal research by the German physicist Carl-Friedrich von Weizsäcker in 1943 was not immediately communicated to American colleagues but remained little known until nearly the end of World War II. Boss seems similarly unaware of political and ideological issues that clouded the reception of cosmological research by the famous Soviet polar explorer and astrophysicist Otto Schmidt and his colleagues in the West in the following decade. And while Boss admirably touches on a wide range of cosmological and cosmogonal research done in Europe, North America, and the Soviet Union in the latter half of the twentieth century and notes certain works by Stephen G. Brush, he seems unfamiliar with recent research on this topic by historians of science such as Steven J. Dick and Robert W. Smith.

Fortunately, Boss is far more interesting and insightful when he narrates from firsthand experience. His core chapters paint a broad portrait of astrophysical research in the 1990s. Boss offers numerous reflections on the development of late twentieth-century cosmogony, arguing, for instance, that its progress depended not only on new precision measuring techniques like Doppler spectroscopy but also on the development of ever more powerful computers that enabled astrophysicists to model the accretion of planets from clouds of particles surrounding newborn stars. But Boss also has a sharp eye for social factors that influence scientific research, including the intellectual lineage of key researchers and the complications that attend priority claims and the attribution of discovery. The discovery of new solar systems stoked intense public curiosity, and Boss reflects on his experiences with reporters and the complex pressures of publicizing new research. In his extended discussion of the role of NASA as a patron for space science, Boss pays particular attention to the background of its chief administrator, Daniel Goldin, arguing that Goldin's plea for advanced planet-seeking orbital telescopes partly reflected his previous experience in building top-secret surveillance satellites for the Department of Defense. Of no less value are Boss's personal insights into the social characteristics of modern astrophysics, including long-standing tensions dividing radio from optical astronomers and the famously argumentative subcommunity of meteoriticists.

Readers seeking a serious historical account of these monumental discoveries will not find it here. But Boss's contribution is a helpful primary source for contemporary cosmogonal research as well as a worthy autobiographical account.

RONALD E. DOEL

Anthony S. Travis; Harm G. Schröter; Ernst Homburg; Peter J. T. Morris (Editors). *Determinants in the Evolution of the European Chemical Industry, 1900–1939: New Technologies, Political Frameworks, Markets, and Companies.* (Chemists and Chemistry, 16.) xii + 393 pp., illus., figs., tables, apps., index. Dordrecht/Boston/London: Kluwer, 1998. $195, £123, Dfl 360.

Determinants in the Evolution of the European Chemical Industry, 1900–1939, edited by a four-member team led by Anthony S. Travis of the Hebrew University of Jerusalem, emerged from a series of workshops sponsored by the European Science Foundation's interdisciplinary program on the evolution of chemistry in Europe. It includes some of the best historical analyses of the industry in this period since Lutz Haber's classic work three decades ago—perhaps even good enough to justify the outrageous price.

All sixteen contributions, grouped in five parts, provide useful perspectives, some on the development of technology and science in relation to industry, others on the political or military ramifications of the chemical industry and