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Life on Other Worlds: The Twentieth-Century Extraterrestrial Life Debate by Steven J. Dick;  
UFOs and Alien Contact: Two Centuries of Mystery by Robert E. Bartholomew; George S.  
Howard; Alien Life: The Search for Extraterrestrials and Beyond by Barry Parker

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nonspecialist, who otherwise will find this a fascinating story.

Dahl's engaging, often conversational style leads to some repetition and occasional awkward phrasing. Some interpretations are questionable: for instance, that the nature of cathode rays was "the most fundamental problem in physics at the turn of the century" (pp. 6–7). Written under the implicit assumption that science progresses inexorably toward the modern viewpoint, this work is not designed for those whose primary interests are philosophical or who desire extensive analyses of extrascientific factors.

The book, which comes with an eye-catching dust jacket, is nicely printed and illustrated and conveniently features both author and subject indexes. Biographical information about lesser-known scientists is included in the notes. For historians, physicists, and others interested in the background to some of the most significant developments of the twentieth century, *Flash of the Cathode Rays* will be a welcome reference tool as well as a good read.

The attractive volume by the physicist E. A. Davis and the historian of science Isobel Falconer was designed "to give a readable account of J. J. Thomson's work on the electron, in the context of his life and other scientific work" (p. xxvii). To this end the authors present Thomson's work chronologically, together with some biographical details and a minimum of background information. Excerpts from Thomson's correspondence and other material that gives some of the period's flavor—such as the Cavendish ditties "Ions Mine" and "An Emanation"—are also included. About half of the book's 238 pages of text are devoted to facsimile reproductions of key papers by Thomson, which follow the text of individual chapters. The authors base their work on period manuscript and published materials but have not attempted to include the secondary historical literature. Full references are conveniently placed at the end of each chapter.

David Thomson, J. J. Thomson's grandson, introduces the volume with an insightful biographical sketch that contains, among other gems, correspondence between J. J. and his future wife, Rose Paget. The book is generously supplied with high-quality illustrations. Formal portraits, charming family photographs, and apparatus from the Cavendish Laboratory—even James Clerk Maxwell's zoetrope for illustrating a vortex molecule—are well integrated with the text.

The authors have been less than successful in their goal of creating a readable book. The text does not flow naturally from topic to topic, and

it is difficult to trace overall themes. Some of the problem stems from the difficulty of presenting a complex subject briefly. Another factor is the placement of the facsimiles, which are not integrated with the narrative. Without more guidance from the authors, the facsimiles might have been better placed in an appendix. A timeline and a collective bibliography would also have been helpful.

This book's many positive features will commend it to readers interested in the history of the electron, particularly those who wish to have original papers, illustrations, and narrative together in one concise volume.

The centenary volume edited by Michael Springford is designed to provide physicists with an overview of the current state of research on conceptual matters involving the electron. An impressive roster of specialists have written essays on a well-conceived array of topics, from the isolated electron (mass, charge, magnetic and electric moments) and the electron in relativistic quantum theory through the electron and its interactions in matter (bonding, magnetic properties of matter, superconductivity, heavy electrons, electron waves and holography) to the electron in the cosmos (plasmas, antimatter, scattering, different types of radiation from electrons, cosmic rays). A historical essay, written from the point of view of present-day knowledge, introduces the volume.

References, mainly for primary literature, are listed alphabetically at the end of the volume, a somewhat awkward placement in a volume of separate essays. The book comes with an attractive dust jacket, and the text is enhanced by excellent illustrations. Historians of physics will especially appreciate the photographs of apparatus in the Cavendish Laboratory museum paired with the diagrams of the same from the original publications.

MARJORIE MALLEY

**Steven J. Dick.** *Life on Other Worlds: The Twentieth-Century Extraterrestrial Life Debate.* xiv + 290 pp., frontis., illus., tables, bibl., index. New York/Cambridge: Cambridge University Press, 1998. \$24.95.

**Robert E. Bartholomew; George S. Howard.** *UFOs and Alien Contact: Two Centuries of Mystery.* 408 pp., illus., apps., bibl., index. Amherst, N.Y.: Prometheus Books, 1998. \$26.95 (cloth).

**Barry Parker.** *Alien Life: The Search for Extraterrestrials and Beyond.* x + 254 pp., illus.,

figs., bibl., index. New York/London: Plenum Trade, 1998. \$27.95 (cloth).

These three books are among the most noteworthy of an array of volumes published in the last few years dealing with the history of ideas of extraterrestrial intelligent life, especially in the twentieth century. The most scholarly of these other volumes is Steven Dick's *The Biological Universe: The Twentieth-Century Extraterrestrial Life Debate and the Limits of Science* (Cambridge, 1996), reviewed earlier in *Isis* (1997, 88:567–568). Among the others are Michael Lemonick's *Other Worlds: The Search for Life in the Universe* (Simon & Schuster, 1998), David E. Fisher and Marshall Jon Fisher's *Strangers in the Night: A Brief History of Life on Other Worlds* (Counterpoint, 1998), and Randall Fitzgerald's *Cosmic Test Tube: Extraterrestrial Contact, Theories and Evidence* (Moonlake, 1998). One source of the interest that has produced these volumes is the excitement resulting from reports beginning in 1995 of the detection of planets orbiting other suns. This line of development has itself already been the subject of at least four books.

Although sharing some similarities, the three volumes under review employ rather different approaches and serve significantly different functions. Steven Dick, a historian of science and astronomer working at the Naval Observatory, wrote his *Life on Other Worlds* as an abridgement and updating of his widely and favorably reviewed *Biological Universe*. Based on the extensive research that went into his earlier volume, *Life on Other Worlds* carries all the credibility of that large volume but is designed to make this history accessible to an audience with strong interests but limited attraction to long and thoroughly referenced books. At this, it succeeds admirably. This newer, shorter (by about half) volume, which provides an attractive text for college students, is more than an abridgement. Dick has updated the contents by discussing not only the most recent reports of new extrasolar planets but also the controversial and widely discussed claims for the detection of microfossil forms in Martian meteorites located on earth. Like the longer volume, it is well illustrated and concludes with a helpful bibliographical essay and an index.

*Alien Life: The Search for Extraterrestrials and Beyond* covers somewhat the same ground as Dick's *Life on Other Worlds*, will appeal to about the same audience, and employs a comparable format (e.g., many illustrations and no

footnotes). Barry Parker, an emeritus professor of physics and astronomy at Idaho State University, writes with scientific credibility and in a clear and engaging style honed in writing nine earlier volumes aimed at presenting science to the educated public. The balance, objectivity, and freedom from sensationalism evident in this volume are too rarely present in publications treating this highly controversial subject. Parker's book is among those relatively few popularizations that can withstand the scrutiny of experts yet sustain and nurture the interest of novices. Historical matters are included, usually in a reliable fashion, but such is not Parker's focus, as is suggested by the fact that his bibliography makes no mention of Dick's *Biological Universe* (1996).

*UFOs and Alien Contact: Two Centuries of Mystery* is a work of serious scholarship by two university professors. Aimed at a somewhat different audience from the books by Dick and Parker, it differs very substantially in both approach and content, as is suggested by the backgrounds and interests of its authors. Robert Bartholomew is a sociologist at James Cook University in Australia who for years has collected reports, reaching back into the nineteenth century, of sightings not only of UFOs but also of such objects as phantom airships, zeppelins, and rockets. George Howard is a professor of psychology at the University of Notre Dame, with special expertise in social psychology. Part 1, comprising somewhat more than half of this two-part book and titled "Strange Things Seen in the Sky," provides fully referenced discussions of dozens of reported sightings of flying machines, from the "Great American Airship Mania of 1896–97" and the "New Zealand Zeppelin Scare of 1909" on up through "Sweden's Ghost Rocket Delusion of 1946" to the waves of reports of UFO sightings in the latter half of the twentieth century. This part convincingly demonstrates that the long history of reports of fictitious flying objects combined with the resources of social psychology place in jeopardy claims made for the reality of flying saucers. Part 2 carries the story further by treating 132 cases of reported abduction or contact by aliens. The authors' analysis is that most persons claiming abduction or alien contact are not psychopathological but, rather, "fantasy prone" persons who can be shown in many cases to have difficulty distinguishing between their fantasies and reality. It is rare that one finds in a single volume such a wealth of historical detail processed through powerful analytical tools of social psychology.

As the new millennium begins, it is encouraging to see three such sober, sensible, and engaging assessments of developments and events in an area that has been filled with controversy.

MICHAEL J. CROWE

**Helmut Behrens.** *Wissenschaft in turbulenter Zeit: Erinnerungen eines Chemikers an die Technische Hochschule München 1933–1953.* Afterword by **Freddy Litten.** (Algorismus: Studien zur Geschichte der Mathematik und Naturwissenschaften, 25.) vi + 184 pp., illus., bibl., index. Munich: Institut für Geschichte der Naturwissenschaften, 1998.

The chemist Helmut Behrens presents his experiences and reflections as a student, assistant, and university teacher at the Technische Hochschule München from 1933 to 1953. Seventy-five pages are devoted to the National Socialist era, ninety-four pages to the postwar era through 1953.

Behrens, one of the few academics who opposed National Socialism from the very beginning, adds new examples and details to what has become known about German universities in the Nazi era and after. He describes the lack of protest by students and faculty against the dismissal of university teachers, most of them Jewish; the widespread National Socialist convictions, especially among students; and the difficulties of continuing research and teaching after the bombing of Munich and the partial destruction of the Technische Hochschule.

Behrens shows the importance of individuals in establishing the political atmosphere at an institution. Thus Martin Heidegger, who was appointed rector of the University of Freiburg in 1933, contributed decisively to the extreme politicization of student life. Not only through his notorious speech of 27 May 1933, but also through his various appeals to students to participate in military sports and other National Socialist activities, he encouraged the zeal of the majority of students who were already National Socialist fanatics. Heidegger sometimes gave his demagogic speeches with the *Völkische Beobachter* protruding visibly from his jacket pocket (p. 6). By contrast, students at the Technische Hochschule München were indoctrinated not by its rector but by the Bavarian ministry of state and the SA (National Socialist storm troopers) office for universities.

Behrens observes that although the escalating measures against Jews, including deportations, were visible to all, nobody talked about these developments and very few people were troubled

by them. Some colleagues later pretended to have known nothing at all (p. 64). The heads of institutes retained considerable freedom in choosing their coworkers and research topics, even during the war, and they were able to conduct respectable basic research (p. 108). Behrens depicts the heads of the Technische Hochschule's institutes of organic chemistry, the Nobelist Hans Fischer, and inorganic chemistry, Walter Hieber, as non-National Socialists who were ready to help those in need. Fischer committed suicide on 31 March 1945, after the destruction of his institute, because he believed he would never again be able to conduct research (p. 73).

Behrens elaborates on the strong opposition among university teachers to the de-Nazification measures that led to the dismissal of many faculty members after the war. One professor even suggested not filling the position he was forced to vacate in order to put pressure on the military government (p. 113). The contrast with the lack of reaction to the dismissals in 1933 is striking. Behrens himself provided many *Persilscheine*—vouchers testifying to political innocence—for colleagues who had been members of the Nazi Party or its affiliates because he found the majority of them to be decent persons. His assessment differs strongly from those of other witnesses: for example, Victor Klemperer, a Jewish (according to the Nazis' definition) professor at the Technische Hochschule Dresden (*Ich will Zeugnis ablegen bis zum letzten: Tagebücher 1933–1941* [Aufbau-Verlag, 1995]), and Werner Schmidt, a "half-Jewish" medical student and physician at the universities of Giessen and Hamburg (*Leben an Grenzen: Autobiographischer Bericht eines Mediziners aus dunkler Zeit* [Suhrkamp, 1993]). Both experienced very few colleagues who behaved decently; the majority participated in the exclusion and dehumanization of their Jewish or "non-Aryan" colleagues. De-Nazification was ended in 1951 by a federal law that allowed almost all of the university teachers dismissed in 1945 to be reinstated (p. 123).

The postwar discussion about restructuring the universities did not include an acknowledgment that the dismissals in 1933 were unjust. The Technische Hochschule in Munich was one of the few places where an émigré Jewish chemist (Stefan Goldschmidt) received a position after 1945. Behrens's description of the attitude of many university teachers after 1933 raises doubt concerning his conclusion that embitterment about the de-Nazification measures was one of the reasons why the Germans did not confront (*fertigwerden*) their past.