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## Faraday at Home and Abroad

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## BOOK REVIEWS

cating the essence of field ethology to students, but this is a hard case to put in a book chapter. Just as only seeing one of his films can really illustrate this aspect of the Tinbergen legacy, the other contributors to this slim volume have to be judged against Tinbergen's own writings; all in all, I think most students will learn more

from the seemingly timeless *Study of Instinct* than from this or any other retrospective.

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Biblical faith and demanded strict adherence to the literal word of Scripture, the Sandemanians were perhaps not quite as dour as they have sometimes been depicted as being; indeed, their practice of serving Scotch broth at their weekly Love Feasts won their church the popular sobriquet of the "Kail Kirk."

A striking feature of the Sandemanian sect, emphasized by Cantor, was its members' strong sense of being set apart from "the world" and of forming a community unto themselves. This was reinforced by close family ties, for Sandemanians—including Faraday and his siblings—tended to marry fellow Sandemanians. As Cantor makes clear, though Faraday had many friends, particularly fellow scientists, who were outside the Sandemanian circle, his most intimate relationships, and the center of his own identity, lay firmly within his church. It formed, both literally and figuratively, his extended family.

Cantor's compelling portrait of Faraday's personality is intended, he says, not as "a reductive exercise but . . . rather as an attempt to show why he was so strongly attracted both to a peculiar religious sect and to science, or, more precisely, an idiosyncratic conception of science" (p. 10). Regrettably, Cantor gives a sustained picture of Faraday's personality only in his final chapter; this might best be read first, to provide a connecting thread as the successive aspects of Faraday's life and thought are examined. Cantor's Faraday emerges as a man with a deep fear of "confusion" of any kind and a strong need to order his environment, themes that pervaded both his science and his religion. Cantor also makes a persuasive case that Faraday's religion affected his science more directly as well, notably in his conviction that nature was orderly and "economical" and that divinely ordained natural powers were indestructible, and in his caution about the speculative interpretation of experimental facts—a caution that paralleled the Sandemanians' adherence to the literal word of the Bible, without interpretation. Indeed, Sandemanian "exhortations" consisted of (carefully chosen) Biblical passages strung together with a minimum of connecting material, just as Faraday's scientific papers ideally consisted of (carefully chosen) descriptions of experimental facts strung together with a minimum of speculative interpretation.

When Cantor discusses Faraday's scientific work, he focuses on his electromagnetic researches—an understandable choice, given the undoubted importance of Faraday's contributions to electrical physics. But one of the striking points about the other works under review is the extent to which Faraday appears, especial-

## Faraday at Home and Abroad

**Michael Faraday: Sandemanian and Scientist.** A Study of Science and Religion in the Nineteenth Century. GEOFFREY CANTOR. St. Martin's, New York, 1991. xi, 359 pp., illus. \$45.

**Experimental Researches in Chemistry and Physics.** MICHAEL FARADAY. Taylor and Francis, Philadelphia, 1991. xvii, 496 pp., illus., + plates. \$55. Reprint, 1859 ed.

**Michael Faraday and the Royal Institution.** (The Genius of Man and Place) JOHN MEURIG THOMAS. Hilger, Philadelphia (distributor, American Institute of Physics, New York).

**Curiosity Perfectly Satisfied.** Faraday's Travels in Europe, 1813-1815. BRIAN BOWERS and LENORE SYMONS, Eds. Published by Peregrinus in association with the Science Museum, London, 1992 (U.S. distributor, IEEE, Piscataway, NJ). xviii, 189 pp., illus. \$33. IEEE History of Technology Series, 16.

**The Correspondence of Michael Faraday.** Vol. 1, 1811-December 1831, Letters 1-524. FRANK A. J. L. JAMES, Ed. Institution of Electrical Engineers, London, 1991 (U.S. distributor, IEEE, Piscataway, NJ). I, 673 pp., illus. \$95.

Michael Faraday is surely one of the best-known scientists of the 19th century. His discovery of electromagnetic induction in 1831, his early steps toward field theory, his great talents as an experimenter, and the romantic story of his rise from humble beginnings to the pinnacle of fame have made him one of the great heroes of science. In recognition of his status—not so much as father but as patron saint of the electrical age—the British Post Office issued a stamp last year to honor the 200th anniversary of his birth in 1791, and his portrait now graces the Bank of England's new £20 note. Scholars have honored Faraday's bicentenary in their own way with a whole series of conferences and publications, and the five works under review represent just part of the recent production of the Faraday industry.

Despite their diversity, these five works have a common thread: all bring out relatively unfamiliar aspects of Faraday's personality and achievements. He appears

here not just in his usual guise as the brilliant electrical experimenter who could seemingly sniff out the truth or as the eloquent lecturer who enthralled fashionable audiences at the Royal Institution. We instead see Faraday as a young man making an extraordinary scientific tour of the Continent at the height of the Napoleonic Wars; as a chemist, doing both original research on new compounds and workaday analyses of water and ore samples; and as a deeply committed Christian, a member, as he told Ada, Countess of Lovelace, of "a very small and despised sect of Christians, known, if known at all, as Sandemanians."

Geoffrey Cantor's *Michael Faraday: Scientist and Sandemanian* is the first full-length study of Faraday to focus primarily on his religion and its role in his life and thought. Indeed, Cantor's opening chapters are in effect a history of the small Sandemanian sect (it never numbered more than about a thousand members) from its beginnings in Scotland in the 1730s to its gradual dissolution in this century. Although they professed a simple



Michael Faraday. Portrait by H. W. Pickersgill, engraved by Samuel Cousins. [From *The Correspondence of Michael Faraday*, vol. 1.]