case provides an adequate basis for testing hypotheses about scientific revolutions. The French chemical community was fairly large and tight-knit and it did swing over to Lavoisier's theory between 1785 and 1789. To judge from McCann's statistics, the French case furnishes substantial support for his claims about the developments accompanying a scientific revolution. Somewhat contrary to prediction, the most rapid growth in the community's size and productivity occurred between 1772 and 1777, *before* Lavoisier managed to convince his fellow chemists that their science was in a state of crisis. Just as predicted, however, the level of theory in the chemical literature rose to a peak in the mid-1780's, then declined; the fraction of articles reporting quantitative results climbed from 25 percent for 1760–1777 to 36 percent for 1778–1795; and the swift triumph of Lavoisier's theory within the French chemical community between 1785 and 1789 was reflected in a rapid rise in the revolutionaries' share of the community's publications and citations.

While McCann marshalls considerable support for his trend hypotheses, he fails to make an effective case for his propositions regarding recruitment. The trouble is that he takes articles, rather than chemists, as the basic units of analysis. As a result a few prolific revolutionaries dominate his statistics, obscuring the details of the recruitment process. For instance, from the evidence presented, it is not at all clear that younger chemists tended to embrace Lavoisier's theory sooner than older chemists in France. (D. L. Hull *et al.*, *Science* **202**, 717 [1978], have recently shown that such a hypothesis is not supported by evidence from the Darwinian revolution in Britain.)

Many historians of science will boggle at McCann's unbridled enthusiasm for statistics, his somewhat cavalier attitude toward historical research, his failure to provide such basic information as lists of cited chemists and dates of conversion, and so on. This reviewer, however, welcomes his attempt to subject the theory of scientific revolutions to the bar of quantitative evidence. Although his conclusion that the outcome is almost entirely favorable to the theory is unwarranted because of the flaws in his testing procedures, his goal is laudable and his version of the theory suggestive. It is to be hoped that similar, more sophisticated studies will soon be forthcoming.

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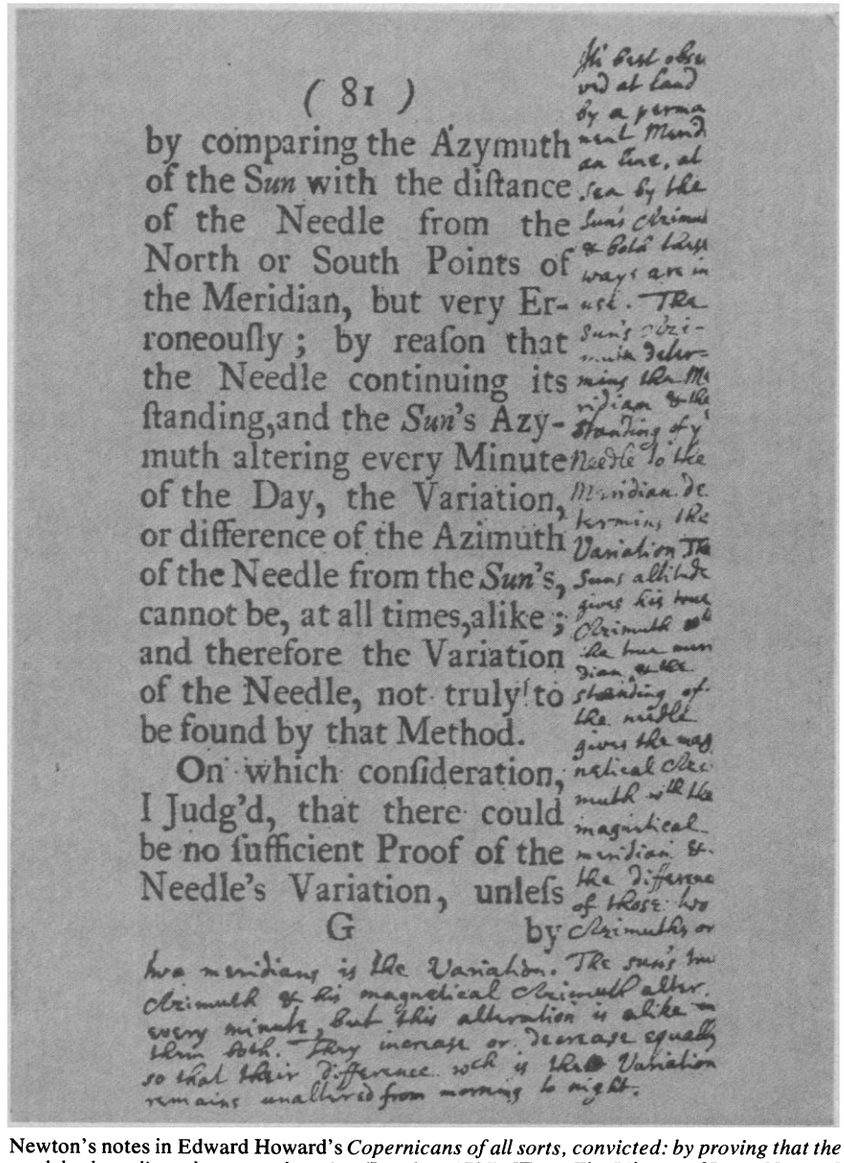
Newton's Reading

The Library of Isaac Newton. JOHN HARRISON. Cambridge University Press, New York, 1978. xiv, 286 pp. $62.50.

I cannot think of enough good things to say about John Harrison's book on Newton's library. It is a book aimed at Newtonian scholars, and as such a scholar I can affirm that Harrison has given us just what we wanted. The heart of the book, filling two-thirds of its pages, is a catalogue of 1763 works for which there is evidence that Newton owned them. Two catalogues made by later owners of the library, which Richard de Villamil published in 1931, furnish the basis of the present catalogue. Those two 18th-century catalogues were mere lists, with entries so abbreviated they were frequently difficult to interpret. Harrison's entries provide full bibliographic references for all the books he has been able to identify (the overwhelming majority), and he has further supplied numerous cross-references. He has gone far beyond this. Nearly half of the library, kept intact for more than two centuries, is now in Trinity College, Cambridge, and quite a few other volumes once in it have surfaced in various other collections. Harrison has inspected all the books in Trinity and many of the others; in his catalogue he supplies a history of references to each volume, its present location if known, any inscriptions Newton or others inserted, and a resume of notations Newton made in it. In a large number of cases the inscriptions of others were written by authors in copies they were giving to Newton, providing in the early books a precious record of Newton's range of acquaintance and in later ones testimony to


(81)

by comparing the Azymuth of the *Sun* with the diſtance of the Needle from the North or South Points of the Meridian, but very Erroneouſly; by reaſon that the Needle continuing its ſtanding, and the *Sun*'s Azymuth altering every Minute of the Day, the Variation, or difference of the Azimuth of the Needle from the *Sun*'s, cannot be, at all times, alike; and therefore the Variation of the Needle, not truly to be found by that Method.

On which conſideration, I Judg'd, that there could be no ſufficient Proof of the Needle's Variation, unleſs

G by

Newton's notes in Edward Howard's *Copernicans of all sorts, convicted: by proving that the earth hath no diurnal or annual motion* (London, 1705). [From *The Library of Isaac Newton*]

his stature. In including information on such matters Harrison has raised the usefulness of the catalogue to a wholly new level.

As an introduction to the catalogue, Harrison provides an informative essay on the library and its history since Newton's death. The first chapter of the essay carries the title "Isaac Newton: User of books." Newton did not buy books for the pleasure of owning them; he bought them to study. Not only did he frequently write notes on the endpapers and in the margins, he also developed a peculiar method of dog-earing pages in which he folded the corner so that it pointed directly to the passage in which he was interested. The catalogue mentions what books have dog-eared pages (even giving specific pages when they are not too numerous) as a further indication of the books for which there is evidence of Newton's careful study.

Harrison argues that with a person like Newton, for whom the content of a book mattered more than possession, we must keep in mind other sources available to him as we attempt to interpret his personal holdings. We know from letters that Newton had access to Isaac Barrow's collection by 1670, and while he remained in Cambridge he could also use the college and university libraries. The large number of alchemical works in his personal library, for example, may have been due in part to their paucity in the other libraries. I might add, and Harrison would agree, that we cannot in this way reason away the fact that roughly 10 percent of Newton's collection consisted of alchemical titles, especially since their percentage among the books with signs of use (dog-eared pages and notations) is much higher. With respect to theological works, when we keep in mind Barrow's collection and the institutional libraries, all heavy in such works, the very high percentage of theological titles in Newton's own collection is even more impressive, though many of them apparently date from his London years. In both cases, alchemy and theology, the catalogue only reinforces what Newton's own papers have to tell.

Harrison's introduction concludes with a perceptive analysis of the library which includes several tables that list its contents by categories. His volume is consistently understated and unpretentious. It behooves the reviewer in such a case to insist on its merit.

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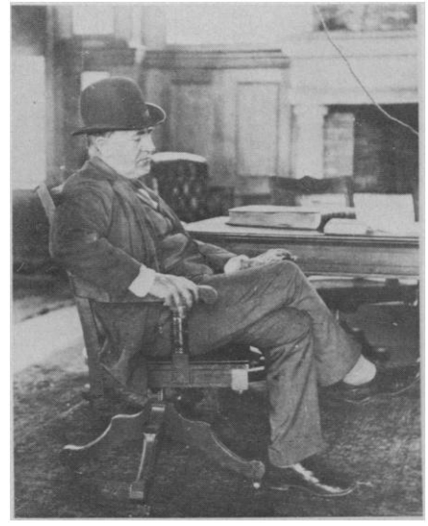
Flaws in a Hero

A Streak of Luck. ROBERT CONOT. Seaview, New York, 1979 (distributor, Simon and Schuster, New York). xviii, 566 pp. + plates. $15.95.

That 1979 is the centennial of Thomas Edison's incandescent light is a fact widely known and marked with appropriate hoopla. That this year is also the 100th anniversary of Edison biographies is a somewhat more obscure fact, but hardly less remarkable. Robert Conot takes his place in the long line of biographers with the same qualifications of many of his predecessors, those of a journalist. But there the similarity stops. Two features of Conot's work make it stand apart from the rest. The first is Conot's research in the "scientific King Tut's tomb," as he puts it, that is the vault of Edison papers and records kept at the old Edison laboratory in West Orange, New Jersey. The second is Conot's personal reaction to the Edison his research uncovers. Instead of feeling the usual affection for America's most heroic inventor, Conot seems most impressed by the flaws he finds in Edison's character—flaws that threaten to overshadow the Edisonian achievement.

Conot's own achievement in mining the letters and notebooks at West Orange is prodigious. For the scholar the primary value of *A Streak of Luck* lies in the glimpse it affords of the wealth of records Edison and his associates left behind them. Conot is not the first biographer to make extensive use of these sources—Matthew Josephson relied on them for the well-received *Edison* that he wrote 20 years ago—but he is the first person to attempt to piece together Edison's life and career bit by bit from the Edison archives. The extent to which he succeeds is remarkable. Many of the myths simply fall away, for Conot scrupulously avoids repeating the stories other biographers picked up from dubious sources, including Edison in his more imaginative moods.



Thomas Edison in his laboratory library, 1903. [From *A Streak of Luck*, courtesy of Edison National Historic Site]

The Edison that emerges from Conot's descriptions is not an attractive man. Opportunistic, often ruthless, he seems driven by a passion for invention combined with a hunger for wealth. His disregard for financial and contractual obligations often overshadowed an innate honesty. Sometimes an abominable businessman despite a lifelong concern about money, Edison was apparently an even worse husband and father. He did not hesitate to exploit those who worked under him, and his egotism and crudeness often drove away the best of them. The persistence that Edison himself said was the key to his success frequently turned into stubbornness and even bullheadedness, as in his pursuit of magnetic ore enrichment, his unbending opposition to alternating current, or his refusal to keep up with changes in the phonograph industry.

A Streak of Luck is not a sympathetic biography. Extraordinary attention is devoted to such things as the miseries of Edison's children, his uncouth and unclean personal habits, and, most oddly, his sleepiness. Conot is offended by the picture of Edison as a human dynamo requiring only a few hours' sleep and an occasional catnap. This "most persistent legend" is dismissed as "a smokescreen to divert attention from his habit of nodding off" (p. 467). Page after page is devoted to the intricacies of Edison's business dealings, frequently resulting in a picture of him as a conniver or a bumbler. Edison's capacity for almost unthinkingly spending money—often large sums—is illustrated in sometimes mind-numbing detail. Cynical, willful, and self-centered, Conot's Edison is neither the kindly, humble, white-haired old man