seem to be present in the usual abundance for a typescript. Some are typographical, and some appear to be a matter of translation. Most are readily apparent to an expert but could be confusing to a novice.

The only books remotely similar to this one that come to mind are two that deal more fully with the mechanics of electron transfer processes, but otherwise do not cover the wide range of material in Davydov's book. They are Charge Transfer Processes in Condensed Media by Jens Ulstrup (Springer-Verlag, 1979) and my forthcoming book Quantum Mechanical Tunneling in Biological Systems (Cambridge University Press), which is a revision of a paper of the same name published in Quarterly Reviews of Biophysics 13, 387 (1980)

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## A World on Paper: Studies on the Second Scientific Revolution

E. Bellone

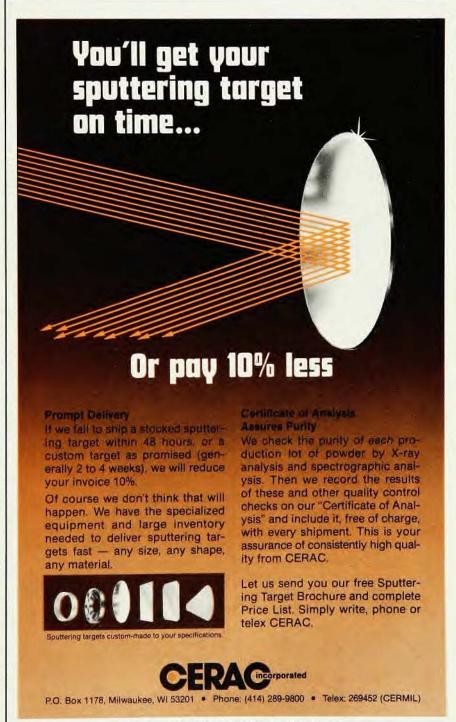
220 pp. MIT Press, Cambridge, Mass., 1980. \$14.95

Enrico Bellone's book, first published in Italian in 1976, examines "the transition from classical mechanics to the modern view of the physical world." Predominantly a 19th-century development, this "second scientific revolution" runs, in Bellone's chronology, from 1687 (Issac Newton) to 1913 (Niels Bohr) and, in fact, still continues. The author intends his story to vindicate the autonomy of science (and the history of science) against the supposed claims of unnamed philosophers to reduce it to some predetermined scheme. Bellone repeatedly attacks the view that physics in the 18th and 19th centuries was guided by scientists' attachment to "mechanism" (involving both a materialist ontology and a particular methodology) and that "the roots of contemporary physics... lie in a philosophical verdict against mechanism itself and in a deep-seated crisis of physics, which verdict and which crisis occurred in a relatively short period of time around the turn of the century.'

The book's tenor is critical, or rather polemical, since Bellone consistently refuses to engage seriously the simplistic views he opposes or even to name their authors. Equally frustrating is his failure to define the essential characteristics of the classical mechanics or modern physics whose evolution he wishes to describe. Nor does he tell us how to distinguish "physicists" from "philosophers"—as his thesis of the irrelevance of philosophical criticism to the development of modern physics

requires—in a group that includes Ludwig Boltzmann, Albert Einstein, Ernst Mach, Max Planck and Henri Poincaré. Bellone's overriding desire to explode the consistently unattributed notion that physicists' attachment to a monolithic "mechanism" guided the development of 19th-century physics leads him to deny the label "mechanist" even to Boltzmann and Lord Kelvin, in which case the word simply loses all meaning.

Bellone's concept of a scientist's "dictionary"—the interconnected set of theories, ideas, assumptions, techniques, and the like that the scientist entertains—may not be as original as he and Stillman Drake (who provided a foreword) would have us believe, but it is surely useful. Bellone quite correctly insists that scientists choose different strategies from an evolving "dictionary" as they try to come to terms with specific problems. Unfortunately, his polemical preoccupation has apparently deflected his attention from what he elsewhere recognizes are the crucial



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historical details. For example, how does Boltzmann's "dictionary" evolve as he addresses different problems over time? Bellone recognizes that the concept of probability is central to the work of Boltzmann and others, and that its role changes, but he doesn't identify in detail the particular route by which probability evolved from an averaging tool to a concept of fundamental physical significance. Nor does he treat with any sophistication crucial differences in the degree of commitment to mechanical models along the ontological-heuristic axis, or the frequent tension between scientists' private opinions and the views they regard as publically tenable.

Although A World on Paper neither lives up to historiographic pretentions nor succeeds as narrative history of science, Bellone does have some interesting things to say about his major protagonists, and the book can be read with profit by students of 19th-century physics who can exercise a moderating judgment on its claims.

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### new books

#### Instrumentation and Techniques

Computer Aided Design: Fundamentals and Systems Architectures. J. Encarnaçao, E. G. Schlectendahl. 346 pp. Springer-Verlag, New York, 1983. \$29.50

Advances in X-Ray Analysis. Vol. 26. Proc. Thirty-First Annual Conference on Applications, Denver, August 1982. C. R. Hubbard, C. S. Barrett, P. K. Predecki, D. E. Leyden, eds. 473 pp. Plenum, New York, 1983. \$62.50

Reviews of Infrared and Millimeter Waves. Papers, 20th General Assembly of the Union-Radio-Scientifique Internationale, Washington, August 1981. Vol. 1. K. J. Button, ed. 372 pp. Plenum, New York, 1983. \$45.00

Methods of Steady-State Reactor Physics in Nuclear Design. R. J. J. Stamm'ler, M. J. Abbate. 506 pp. Academic, New York, 1983. \$48.00. reference

Lock-in Amplifiers: Principles and Applications. M. L. Meade. 232 pp. Peter Peregrinus, (US dist. IEEE, Piscataway, N.J.), 1983. \$60.00

Miniaturization of High-Energy Physics Detectors. Proc. Meeting, University of Pisa, Italy, A. Stefanini, ed. 259 pp. Plenum, New York, 1983. \$39.50

Fortran Optimization. M. Metcalf. 242 pp. Academic, New York, 1983. \$24.00. reference

High Gradient Magnetic Separation. R. Gerber, R. R. Birss. 209 pp. Wiley, New York, 1983. \$51.95

The Randon Transform and Some of Its Applications. S. R. Deans. 289 pp. Wiley, New York, 1983. \$34.95. reference