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Hankins, Thomas L. (1-WA)

★**Science and the Enlightenment.**

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Cambridge University Press, Cambridge, 1985. viii+216 *pp*. $29.95. *ISBN* 0-521-24349-1

The aim accomplished by the book is two-fold: To give an over all impression of 18th-century sciences (including “moral sciences”, i.e., social science) in their mutual dependency and in their relation to contemporary general ideas (especially the ideas of the French Enlightenment); and to convey an understanding of the sorts of reasons (philosophical as well as experimental) which spoke in favour of specific theories and points of view, be they “correct” or “erroneous” seen in a 20th-century perspective. Indeed, the author distances himself very clearly from all “Whig” interpretations (pp. 153–155). The presentation is organized according to major fields of scientific enquiry (“the character of the Enlightenment”; “mathematics and the exact sciences”; “experimental physics”; “chemistry”; “natural history and physiology”; “the moral sciences”), and includes in each case accounts of main approaches, select problems and problem complexes, disciplines and theories. Due to the already advanced state of 18th-century mathematics, the accounts dealing with this subject are very general and nontechnical, while more technical discussions are presented, e.g., in the cases of electricity and chemistry. The relation to Enlightenment philosophy makes the perspective predominantly French.

The chapter on mathematics and exact sciences discusses first “analysis”, both as a general methodological idea of the times and as this general idea reflected itself inside mathematics. As a specific problem-field, the investigation of motion along a curve is presented. From the fields of “mixed mathematics” (mechanics, astronomy, optics, acoustics, probability theory, and geography) the controversies over mechanical principles (the vis-viva-conflict) are presented (internally and in the context of Enlightenment philosophy) together with the tests of Newton’s theory of gravitation (the shape of the Earth, the motion of the lunar apogee, and the return of Halley’s comet), the progress in observational astronomy and the beginnings of physical astronomy. Probability theory is dealt with under the heading of “moral sciences”.

The chapter on experimental physics (and that on moral sciences) presents the controversies over the general applicability and validity of mathematical methods (d’Alembert and Condorcet favoring a general mathematization, Diderot, Buffon and Franklin arguing against excessive use of mathematics in empirical and experimental sciences). Of further interest for the historian of mathematics is the discussion of the role of the theory of “subtle fluids” (electricity, heat, etc.) as a basis for a first mathematization of the experimental subjects, which then eventually would reduce the fluids to superfluous heuristic devices.

The book concludes with a 13-page bibliographic essay, organized in correspondence with the preceding chapters. Three pages deal with mathematics and exact sciences, two with experimental

physics.

Reviewed by *Jens Høyrup*