(for instance, he says little about the possible roles of crystal imperfections in surface charging).

The book consists of three parts. The first introduces the basic problems, the second is devoted to the theoretical aspects, and the third consists of interpretation of the experimental data in light of the considerations of the first two parts. Parts 1 and 2 will be of interest even to those readers not directly concerned with surface charging, for the author tackles such fundamental problems as the nature of solid surfaces and surface phenomena. His treatment of the quantum mechanical aspects is one of the most lucid (and readable) I have seen. His treatment of the nature and behavior of solid surfaces is also clear, and he demonstrates considerable insight into the subject. The author's only fault in this instance is that he makes virtually no reference to the important advances of the 1960's.

The reader will find Part 3 somewhat anticlimactic. The author tends to forget the basic purpose of the book and ends with a rather unnecessary discourse on textiles. This reviewer feels that the pages devoted to textiles could much more profitably have been spent on a summary of the problem, logic, and conclusions (no such summary appears in the book). The book also suffers from an extremely meager subject index. Nevertheless, the book's readability, its clear exposition of the subject, and the author's obvious familiarity with the field make it a worthwhile contribution. Those concerned with such apparently diverse subjects as atmospheric electricity, nucleation, mine and industrial safety, adhesion, and surface physics in general will find this book to be of considerable interest.

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## Cosmologist and Critic

**Le Livre du Ciel et du Monde.** NICOLE ORESME. Albert D. Menut and Alexander J. Denomy, Eds. With a translation from the French and an introduction by Albert D. Menut. University of Wisconsin Press, Madison, 1968. xiv + 778 pp., illus. $17.50.

Nicole Oresme completed his *Livre du ciel et du monde* in 1377, at the request of Charles V of France. It consists of a French translation of Aristotle's *De caelo* (*On the Heavens*), accompanied by Oresme's commentary interspersed throughout the text. In Oresme's opinion, "never in this world was there a book on natural philosophy more beautiful or more powerful." In this superb new edition, Albert Menut and the late Alexander Denomy have supplied us with the medieval French text and a modern English translation on facing pages, preceded by several brief introductory chapters. Their scholarship, from beginning to end, has been of the highest order, and we are in their debt for this contribution to the growing corpus of medieval scientific works in modern editions and translations.

In his commentary Oresme attempts, in the first place, to make Aristotle intelligible to the educated layman by explaining and illustrating the text of *De caelo*. But often Oresme finds the Aristotelian theory untenable, and on such occasions he vigorously attacks the Philosopher by calling attention to flaws in the argument, describing observations that teach otherwise, and noting inconsistencies between this and other Aristotelian works. It is thus evident that Oresme's Aristotelianism was far from rigid. Indeed, he was in the forefront of the attack on Aristotle in the 14th century; he was a leader among those who, without formulating a systematic alternative, were with increasing vigor expressing their dissatisfaction over the details of the Aristotelian system. Thus Oresme reveals himself to be an original and creative thinker not by formulating a new philosophy of nature but by advancing many novel and creative criticisms of the old philosophy of nature.

Some of Oresme's novelties are already rather well known: for example, he argues at considerable length for the diurnal rotation of the earth, before concluding against it (pp. 521–39); in the course of this exposition, he presents several of the arguments later advanced by Copernicus for the mobility of the earth. He also discusses the plurality of worlds, arguing that if there were more worlds than one, each would have its own center of gravity (pp. 167–79); he affirms the possibility of a void space beyond the heavens (p. 177); he even speculates about the possibility of oval planetary spheres (p. 391). His ideas about local motion are of particular interest: he argues, for example, that a perfectly smooth sphere rolling on a perfectly smooth table can be moved by any force however small (p. 493); he imagines a tunnel piercing the earth and notes that whatever makes a heavy body descend to the center of the earth will also cause it to ascend after passing the center (p. 145); as an alternative to Aristotle's simple ratio relating motive power, resistance, and speed, he defends Bradwardine's exponential function (pp. 111–13). Finally, among the topics that most fascinated Oresme were the mathematical perplexities associated with incommensurability and infinity, to which he returns repeatedly (pp. 103–11, 119–21, 197–205, 427, 599–603).

This volume will not be light reading for the 20th-century scientist; not only is the conceptual framework unfamiliar, but the commentary form of the treatise demands a maximum of concentration if the reader is to follow the argument. It is therefore likely to be of greatest value to professional historians of science. Nevertheless, for anybody who perseveres there are many treasures to be found and much insight to be gained regarding the nature of medieval thought.

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## Philosophical Trends

**Boston Studies in the Philosophy of Science.** Vol. 3. In Memory of Norwood Russell Hanson. Proceedings of the Boston Colloquium, 1964–1966. ROBERT S. COHEN and MARX W. WARTOFSKY, Eds. Reidel, Dordrecht; Humanities Press, New York, 1968. xlx + 489 pp., illus. $18.50. Synthese Library.

Norwood Russell Hanson was an internationally known philosopher and historian of science who met an untimely death last year in the crash of the plane he was flying. The almost two score brief homages included in this volume dedicated to his memory testify to the high regard and warm affection in which he was widely held, and give the reader a good sense of Hanson's tempestuous intellectual and physical vigor. The volume also contains a useful list of his publications, and reprints an essay by him in which he states at some length and in characteristic style the logical grounds for his forthright atheism.

But the bulk of the book is made up of 18 other papers, most of them originally presented at meetings of the Boston Colloquium for the Philosophy of Science, together with comments on a number of them by participants in the