

## BOOK REVIEWS

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### **The Astronomical Revolution**

by **Alexandre Koyre**

Translated from the French version by

**Dr. R.E.W. Maddison. Herrmann: Paris, 1973.**

*Reviewed by Joseph J. Stanovsky*

Dr. Maddison, as translator of this work, leads us into the French language of Alexandre Koyre to reveal the special attributes and contributions of Copernicus, Kepler, and Borelli—three individuals who changed, for all times, the key concepts of astronomy. The book can be considered difficult to read but well worth the effort of students, teachers, finished professors, and individuals with an unsatisfied curiosity about the history of modern astronomy.

Mr. Koyre pulls you back to an earlier time and reveals the ideas and restraints which were impressed on the minds of men and from which these three struggled to escape. A knowledge of Renaissance history or a parallel reading in the field is helpful.

Koyre sets down the modern controversy on nationality of Nicolai Copernici Torinensis, the literary name of Copernicus. The result is a satisfying Mykolaj Kopernic, a Pole, but also a citizen of the world. He was educated in Crackow and afterwards in Bologna, Padua and Ferrara.

And the Italian education is important. Copernicus was in the Roman province just forty-three years after Lorenzo Valla, and in the time of da Vinci, Machiavelli, Michelangelo, and the prince of the humanists—Erasmus. "Copernicus is not a narrow specialist, an astronomico-technician, but a man deeply imbued with the entire, rich culture of his period, an artist, savant, scholar, man of education: a humanist in the best sense of the word."

His education is mirrored in his arguments in favor of the Earth's motion. It showed little knowledge of any physical science. About this Koyre explains: "Copernicus certainly gives none. In fact, he could not give any. We must admire — so did Galileo — the power and boldness of his mind, which by pure intellectual intuition was able to overcome all the obstacles that had impeded the advance of ideas."

Johann Kepler enthusiastically accepted the work of Copernicus. His pursuit of the explanation of the motion of Mars is told vividly. Koyre says: "Without Kepler, without the strenuous work he undertook, without his years of laborious and wearisome calculations, the progress of astronomy would have been delayed for a century; without Kepler, there would have been no Newton."

Much of the story of Kepler's work is available in other sources. But the evolution and development of Kepler's ideas is known from his own writing. Koyre describes the laborious efforts of trial and error — the process of repeating solutions according to the methods of each principle and thereafter contrasting the results, the explanations of the disparity between each solution and the struggle to devise an acceptable theological explanation from the foundation of the description of planetary motion.

The evolution of the idea of planetary motion from circle to oval to ellipse shows incredible persistence. The result is celestial physics. "It is to Borelli's credit that he recognized the importance of Kepler's work and that he frankly accepted the Keplerian revolution — the ellipticity of planetary orbits — and, at the same time, definitely jettisoned the privileged notion of circularity."

The errors in his work precluded Giovanni Alfonso Borelli from developing theoretical astronomy, but he was influential in the work done by Hooke and Newton. Koyre says: "However, the credit and exemplary value of Borelli's work lie in his attempt — and its failure".

The book is well documented with notes, explanations, and supporting citations. It is a satisfying book for individuals laboring in fields developed from Newtonian Mechanics.

**A Random Walk in Science, by R.L. Weber (Compiler)****Crane, Russak and Co., Inc. 1974. 206 + xvii pp.***Reviewed by Jesse J. Defore*

R.L. Weber has compiled in this volume an anthology of stories, anecdotes, and excerpts from other works that deal with the lighter side of science and the humorous characteristics of scientists. His announced intention is "to rescue scientists from the unattractive stereotypes and caricatures with which they are encumbered." In this reviewer's opinion, he has succeeded well.

In a part of his book, Weber has collected a number of examples of scientists laughing at themselves and pulling the legs of their colleagues. Among this category are such delightful classics as "A Stress Analysis of the Strapless Evening Gown," a "codification" of Murphey's Law, and the passage from *Gulliver's Travels* that describes a computer designed to allow the most ignorant person to "write Books in Philosophy, Poetry, Politicks, Law, Mathematicks and Theology without the least Assistance from Genius or Study."

Most readers will chuckle as Weber gives translations into standard English of some of the phrases that constitute the common jargon of technical reports. For example, "it has long been known that..." translates to "I have not bothered to look up the original reference."

Some stories feature incidents from the professional lives of famous scientists. Weber recounts the origin of the Alpher, Bethe, and Gamow paper (it appeared in the April 1, 1948 issue of *Physical Review*) that Bethe knew nothing about before publication; Gamow had simply not been able to resist the obvious pun.

Parts of the collection are more serious. There are extracts from Taylor's "Galileo and the Freedom of Thought" and excerpts from some early scientific reports, such as Jeremiah Horrax's observation of the transit of Venus in 1639 and John Dalton's discovery of his own color blindness in 1792. Readers will come to realize that early scientific writings were far more personal than they appear now, and the book will help to give flesh to the shades of these early discoverers. The book also includes some brief comments on their own work by Isaac Newton, Michael Faraday, and others.

*A Random Walk in Science* is easy reading and entertaining; it is also thought provoking. It is a book for a varied readership: teachers will collect the stories and retell them to students; scientists will enjoy a chuckle at their own expense; and the general reader will discover that scientists are human after all.

The *Arabian Journal for Science and Engineering* encourages readers to submit thoughtful, indepth reviews and evaluations of books on science, engineering, technology, and education in the scientific and engineering fields. Reviews will be considered for publication in much the same manner as articles and should be submitted in duplicate. Maximum length for a review is five double-spaced, typewritten pages. textbooks will not be reviewed.