

trained social psychologist to enter caveats at every possible point, most of them well made. But the book has suffered throughout from the unsystematic inclusions of such variables as culture—in the sense of the specific culture of a given tribe—the social situation, both in macrocosms and microsomic terms, and the general disjuncture between the minute analyses of a large number of detailed and inconclusive results and ambitious set of very general hypotheses. Although the material is too fragmentary to be anything but suggestive, it does reinforce the very strong probability that a continuum from uncivilized to civilized, even though it expresses the views of the industrialized West and the aspirations of most of the people in the world, is not a satisfactory frame of reference. Both individual cultures and individual social systems and particular situational analyses are needed as mediating variables.

The book is raw material on the confusion about the undefined boundaries between anthropology, sociology, and social psychology, when any one of the three disciplines attempts to deal with sociocultural change.

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A History of Mechanics. René Dugas. Translated by J. R. Maddox. Editions du Griffon, Neuchâtel, Switzerland (Central Book Company, New York), 1955. 671 pp. Illus. \$15.

Mechanics in the Seventeenth Century. René Dugas. Translated by Freda Jacquot. Editions du Griffon, Neuchâtel, Switzerland (Central Book Company, New York), 1958. 612 pp. Illus. \$15.

A natural reaction to any new book on the history of mechanics is to compare it with Ernst Mach's work, which first appeared in 1883 and which is now a historical document. Mach's arrangement was topical, and his discussion of meaning was directed toward a philosophy of knowledge. In *A History of Mechanics*, Dugas is more purely historical. "We have preferred here to follow the elementary order in time" (page 12). In the foreword, Louis de Broglie states the difference in these words: "Certainly, the reading of Mach's book, so full of original ideas and profound comments, is still ex-

tremely instructive and absorbing. But Dugas' history of mechanics has the advantage of being less systematic and more complete" (page 8). Mach presented us with a textbook of mechanics based on its history; Dugas provides a well-selected and copiously annotated sourcebook. Almost one-third of it is devoted to developments in this century. Here, Dugas changes his method and divides each chapter into two parts: presentation, and analysis and interpretation.

The task of the translator must have been quite difficult, and in some places it was too difficult for him. This may diminish the reading pleasure, but leaving obvious criticism aside, it may also induce attempts to substitute better versions: for example, for the very last sentence of this book: "Poincaré thus gave his adhesion to the theory of relativity" (page 650).

In *Mechanics in the Seventeenth Century*, Dugas expanded, about sixfold, part 2 of his earlier volume, but the multiplication is not uniform. Thus, Descartes now is given 85 pages against 15 in the previous volume; Newton almost 100 against 18; and Leibniz about 60 against only 3. Dugas admirably carried out his intention to give "not . . . science romanticized, but the romance itself of science" (page 15). He did not even write separate biographical notes, but lets the character of the authors reveal itself in quotations and polemics. The spirit of the 17th century comes alive in the words of these men and in the description of their experiments. We experience "the romance itself of science" when we read about Pascal's experiment with glass tubes that were 40 feet in length (page 211), and we try to visualize how he handled them, one filled with water, the other with wine, to build his barometer which was attached to the mast of a ship.

Naturally, the story could not be strictly confined to the 17th century. A glimpse of the antecedents and of the radiations into the next century was necessary.

What Louis de Broglie says about this book is valid for its companion as well: "It will appeal not only to those who love the history of science, but to all those who are interested in the painful but magnificent processes of the human mind in its search for truth" (page 11).

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Galileo and the Scientific Revolution. Laura Fermi and Gilberto Bernardini. Basic Books, New York, 1961. x + 150 pp. Illus. \$3.50.

The Watershed. A biography of Johannes Kepler. Arthur Koestler. Doubleday, Garden City, N.Y., 1961 (available to secondary school students and teachers through Wesleyan University Press, Columbus 16, Ohio). 280 pp. Illus. \$0.95.

Michelson and the Speed of Light. Bernard Jaffe. Doubleday, Garden City, N.Y., 1961 (available to secondary school students and teachers through Wesleyan University Press, Columbus 16). 197 pp. Illus. \$0.95.

Faraday as a Discoverer. John Tyndall. Introduction and notes by Keith Gordon Irwin. Crowell, New York, 1961. xvii + 215 pp. Illus. \$2.75.

The Fermi-Bernardini volume on Galileo is a delightful and remarkable product of the revolution occurring in our own day, under the impact of such science historians as I. B. Cohen, Marshall Clagett, Anneliese Maier, and A. C. Crombie, in the mode of approach to the history of science. *Galileo and the Scientific Revolution* is as fresh and invigorating a work in the field of science biography as was its hero in his day in the fields of physics and astronomy. It may well be regarded as the first sound, objective, and truly analytical evaluation of a great mind that left its mark on history by giving it two twists—one in the realm of motion which cleared past confusions, the other in the employment of the telescope which opened up vast horizons. Gone is the old and naive, teleological conception of man's road to scientific knowledge upon which strode determinedly the lowly but just seekers after truth, only to be badgered and mocked by the demonic agents of evil. As this little book so lucidly and concisely relates, the actual road is far more complex than that, more beset with unseen bumps and curves, yet far more intriguing and fascinating than the simple-minded portrayals of the past indicate.

The book is charmingly written in simple, direct, and absorbing style, without fanfare or emotionalism, thus placing the burden of both drama and judgment upon the reader's enriched and stimulated mind. It adheres strictly to the facts securely established, avoiding such juvenile pitfalls as the postulation of trickeries or forgeries with which to explain away deep-seated