

## Sigma Xi, The Scientific Research Honor Society

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Review

Reviewed Work(s): Archimedes by E. J. Dijksterhuis and C. Dikshoorn

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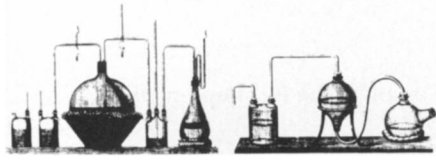
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every chapter were to be tested in the lab, as well as solved on paper, a more intensive two-semester introductory course might be created. Solutions are provided to roughly half the problems.

The properties of materials and theory and applications of devices are not covered. For example, there is no description of the operation of a P-N junction, although there is extensive discussion of the shape and depth of the junction. These subjects should be covered by other texts. This book may find use as a handy, inexpensive reference for circuit designers and cleanroom technicians, providing important formulas and tables in a single volume. The paperback edition, however, is not exceptionally durable.—*R. Jett Field, Electrical Engineering, Yale University*

## History and Philosophy of Science



**Archimedes.** E. J. Dijksterhuis. Trans. C. Dikshoorn. 457 pp. Princeton University Press, 1987. \$15 paper.

The heritage of Archimedes, the Syracusan mathematician and inventor, comprises not only the familiar series of anecdotes about his inventions, his bathtub, and his death in 212 B.C., but also ten or twelve books that posterity has counted among the most brilliant in the history of science. Archimedes wrote on numerous subjects, but most of his surviving works deal with two themes: the surface areas and volumes of plane and solid geometrical figures, and propositions in statics concerning balance of weights and center of gravity. In his most astonishing book, the *Method*, Archimedes describes a conceptual technique, applying the law of the balance to infinitesimal sections of geometrical figures, by which he discovered the theorems on areas and volumes that he elsewhere proved with elegance and rigor by the equipment of classical Greek geometry.

Dijksterhuis's *Archimedes* is both a book about Archimedes and a translation of his works, and in both respects it is outstanding. The translation is not a literal rendering of the Greek mathematical prose; instead Dijksterhuis employs a notation that faithfully and compendiously represents the arguments that Archimedes states in words, without encouraging the reader to import the anachronistic concepts that often creep in when early sci-

entific writings are presented in the garb of modern notation. A preliminary chapter usefully collects the lemmas and non-elementary concepts that Archimedes assumes, so that an acquaintance with Euclid's *Elements* is the only prerequisite to understanding the mathematics. Dijksterhuis's thorough introductory survey of the scattered sources for Archimedes's biography shows much cautious good sense.

Thirty years separate the first publication of this book in English and the present reprinting. Although Dijksterhuis's text has not been revised, the publishers have added a useful bibliographical survey of recent Archimedean studies, by a historian who has himself made numerous contributions to the subject. The new edition will expose many new readers to a book that specialists have long held in esteem.—*Alexander Jones, Institute for the History and Philosophy of Science and Technology, University of Toronto*

**Pacific Visions: California Scientists and the Environment, 1850–1915.** Michael L. Smith. 243 pp. Yale University Press, 1987. \$26.50.

Because it deals with California, this well-written and informative book has special value for the early history of environmentalism and the comparative history of the professionalization of science in America. The chief theme of the book is land, and how California's striking environmental diversity (ecology, climate, topography) forced its imported scientists to develop an ecological perspective of interdependency and to advocate new land-use policies and techniques. Particularly interesting is Smith's account of how the landscape challenged orthodox scientific beliefs, and how scientists responded, using the views of Tyndall, Ruskin, and Humboldt to help construct new visions. Only a few nonscientists adopted the new perspective; thus at the book's heart lies the story of the struggles of newly acquired right vision against a greedy, exploitive economic system, reliant on extractive industries, and an anthropocentric view of nature as a warehouse of commodities for human use and profit.

But the book is also a major study of the formation and professionalization of the California scientific community. It focuses on a few key figures and institutions and excludes agriculturalists and engineers, two other groups with technical expertise. Consequently, little is learned about the depth, extent, activity, and ideas of the scientific masses, although Smith does include information about the inclusion and participation of female scientists.

Professionalization entailed institutionalization, legitimation and support, and



Toppled statue of Louis Agassiz at Stanford University following the 1906 earthquake. Despite Agassiz's strong influence on California's first scientists, most of them rejected his stand against Darwinian evolution. From *Pacific Visions*.

defining a socially acceptable role. A key problem for the scientists was to generate an environmentally literate public and to reconcile social advocacy with the dispassionate, neutral, and objective norms of professional science. In that respect, their environmental activism proved especially problematic, as Smith shows in detailing their successes and failures from their fundamental involvement in the Sierra Club to the defeat over Hetch Hetchy in 1913.

Smith's book is highly recommended for those interested in American and environmental history and the history of science in America.—*Donald deB. Beaver, History of Science, Williams College*

**Regional Dynamics: Burgundian Landscapes in Historical Perspective.** Carole L. Crumley and William H. Marquardt, eds. 648 pp. Academic Press, 1987. \$95 cloth, \$39.95 paper.

Historical geography is not a subject much studied in the United States. Our man-made landscape is too new and our relation to it too transitory. In contrast, Europeans, and especially the French, have an almost mystical attachment to land and place. This has fostered a long