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Instruments of Science: An Historical Encyclopedia (review)

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Technology and Culture, Volume 41, Number 2, April 2000, pp. 399-401 (Review)

Published by Johns Hopkins University Press

DOI: <https://doi.org/10.1353/tech.2000.0059>



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## **Instruments of Science: An Historical Encyclopedia.**

Edited by Robert Bud and Deborah Jean Warner. New York: Garland, 1998.

Pp. xxv+709; illustrations, figures, notes/references, index. \$138.

This encyclopedia provides a set of 327 essays, arranged alphabetically, outlining the invention, development, and use of various instruments of science. In their selection the editors have attempted to reflect changes in knowledge of the natural world from classical times to the present, together with the aids and methods used by scholars through the ages in the process of its study. They include the applied sciences and measuring and testing instruments used in such fields as medicine, navigation, surveying, and the monitoring of industrial processes. They also include a few entries that are not about instruments or apparatuses in any commonly accepted sense but

are important in certain branches of scientific research, such as the intelligence test and the organisms *Drosophila melanogaster* and *E. coli* used in biological studies. Although they do not attempt to list every instrument or research tool ever used, they cover a very wide range.

*Instruments of Science* will undoubtedly prove a useful reference work, even though the method of organization and lack of a chronological framework ensure that it will often need to be used in conjunction with other sources of information. For example, it would be difficult to use this book to discover what instruments were available to scholars at a particular time in history. Its main value lies in enabling readers quickly to discover more about instruments mentioned briefly in other works or surviving in historical collections. A particular strength is the number of entries that detail the use of twentieth-century instruments, which have so far received little attention outside the specialist literature of the relevant scientific disciplines.

One of the editors' aims was to provide descriptions in terms that can be understood by readers without any background in science or mathematics. Even so, there are a few entries that assume some prior knowledge, or at least a willingness to go to other reference works to clarify a specific term or concept (there is no glossary). On the whole, the entries for the older instruments are the most accessible. The complexity of some twentieth-century devices makes it more difficult to explain them in a way that any intelligent reader can understand. Those unfamiliar with terms such as "current-potential curves" and "Doppler shift frequency," both of which are used without explanation, will need to look elsewhere.

The entries are intended to address historical debates, when these have occurred, and provide a guide to further reading. Given the large number of contributors covering disparate subjects, there are considerable differences in emphasis, with some entries only mentioning rival claimants to inventions and others summarizing contemporary debate. The space limitations in a work such as this impose definite constraints. Some authors of entries on complex subjects, such as the magnetic compass, simply note key historical figures and leave the reader to follow up their work and its significance elsewhere. Many of the bibliographies are confined to recent secondary works, whereas others include articles or books by the inventors or early users of the instruments concerned. As the reading lists generally contain no more than six items, their main utility will be as a starting point for further inquiry. It should be added that the editors' introduction notes a selection of general introductory works on the history of scientific instruments to assist those who wish to ascertain the context in which particular instruments were developed.

Despite the book's usefulness, there are some irritating omissions, especially for those who might wish to use it as the starting point for further investigation. Even though abbreviations appear extensively in the picture credits, there is no key, and this makes it difficult to track down images.

Although the provision of an illustration for each entry is a welcome touch, some of these are not well integrated with the text. The images of a number of instruments—including several with parts whose names will be unfamiliar to the nonspecialist—include letters or numbers next to components, but no explanation of these either in the figure or in the text. Perhaps the illustrations were not always supplied by the authors, but it is a pity that the opportunity was not taken to increase the usefulness of the work by careful captioning.

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