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REVIEW OF BOOK: PARTICLE ACCELERATORS

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Authors

Livingston, M. Stanley
Blewett, John
McGraw-Hill, New York 1962
et al.

Publication Date

1962-05-01

University of California

Ernest O. Lawrence Radiation Laboratory

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Review of Book: Particle Accelerators. M. Stanley Livingston and
John Blewett. McGraw-Hill, New York 1962.

E. J. Lofgren

Title of UCR:

REVIEW OF BOOK: *Particle Accelerators*. M. Stanley Livingston and John Blewett. McGraw-Hill, New York, 1962. xvi + 666 pp. Illus. \$17.50.

The literature on accelerators, while extensive, consists mostly of papers in journals and project reports. There are only a few books and review articles. In *Particle Accelerators* the authors have produced the most comprehensive volume so far published on this subject.

The arrangement of the book is good. Most of the material is organized around accelerators, by types, with a few topics treated separately. Particle motion in magnetic and electric fields and certain components—ion sources, magnets, and shielding—are given separate chapters, which are generally good. The level of the book is appropriate to a beginning graduate student in physics or engineering, but substantial portions can be understood by undergraduates. The indexing is good, and the extensive references will be useful to all workers in the field.

The physical principles of all presently useful types of accelerators are clearly and completely explained, and the relevant mathematical expressions are presented for convenient reference. Considerable emphasis is also properly given to a technical description of accelerators and components, and some space is devoted to historical material. In these areas the book has shortcomings which mar an otherwise excellent effort. There are interesting descriptions of some pioneering accelerators—for example, the early low-voltage generators—and valuable material on the latest alternate gradient accelerators, on magnetic measurement techniques, and on shielding, for example, but there are also tiresome details on accelerators that are neither pioneering types nor examples of the latest technology. The treatment of sector focused cyclotrons, which have undergone intensive development in the last decade and which now dominate the field in the energy range of tens of Mev, is disappointingly brief. Heavy ion accelerators, another recent development that has interesting special features, are little more than mentioned. The selection of historical material is spotty—there is a good treatment of electrostatic accelerators and of betatrons, but the treatment of Lawrence's development of cyclotrons at Berkeley is not sufficient to convey the extent to which modern accelerators and accelerator laboratories derive from that development. The faults are probably due to the authors, having relied too much on their own personal experiences, which, while undeniably extensive, are not quite great enough to provide a framework for a definitive work covering the entire field.

Despite the faults enumerated and a few errors of fact, the book on the whole is good and will be a valuable addition to every physics library.

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