

I commend the reading of this scientific gem to all who have interests, ranging from casual to penetrating, in color.

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Engineering for high energy

HIGH-VOLTAGE TECHNOLOGY.
L. L. Alston, ed. 408 pp. Oxford Univ. Press, London, 1968. Cloth \$14.40, paper \$7.50

by L. MARTON

To introduce L. L. Alston's book, the easiest way is to quote from the preface: This book "... is based on a high-voltage course, which has been held annually at the Post-graduate Education Centre, Atomic Energy Research Establishment, Harwell, since 1965. It is intended as an introduction for graduate engineers and other scientists. . . ."

Alston, director of electrical research of the British Railway Board, served both as editor and as one of the authors of the 19 chapters written by 17 contributors. Roughly the first half of the book gives a fair, if sometimes rather condensed, presentation of the physical background of the relevant problems; the second half is straightforward classical electrical engineering. This is best illustrated by an indication of the main chapter contents: mechanism and characteristics of breakdown in gases or in high vacuum, electron emission from metals, conduction and breakdown in liquids and in solids, field-design problems, discussion of various high-voltage components and finally a short chapter about electrostatic generators.

Although the treatment varies throughout the book from undergraduate to postgraduate level, it contains a very useful compendium of engineering-type information for the use of the high-energy physicist. Sometimes the approach is too much on the engineering side and shows a lack of flow of information from the physicist to the engineer, or vice versa. For instance: I was quite surprised to learn that the electrical engineers are still using the semiempirical, qualitative method for electrostatic-field mapping, which was current in text-

books of engineering 40 or 50 years ago; nowadays when much more quantitative methods for the determination of field distribution are available I would have expected a little more than the otherwise excellent section on "Evaluation of electric stress by means of the electrolytic tank."

The book is recommended to those who are new to high-voltage technology or who, although familiar with the subject, want to have in one volume a useful survey of the different aspects of the subject.

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Sophomore plodders beware!

FUNDAMENTAL UNIVERSITY PHYSICS, VOL. 3: QUANTUM AND STATISTICAL PHYSICS. By Marcelo Alonso, Edward J. Finn. 598 pp. Addison-Wesley, Reading, Mass., 1968. \$10.50

by FRED L. WILSON

Depending on your belief about what sophomore physics should be, you'll praise or damn this third volume in Alonso and Finn's series. The authors don't claim to have written an ideal textbook. Instead they have aimed at writing a series that would prepare a student for a higher level of understanding of physical concepts than the traditional undergraduate courses offer.

They have tried to do that by writing a calculus-level text, intended mainly for science and engineering students. Its organization and level are comparable to those of *The Berkeley Physics Course*: The treatment is extremely advanced.

An above-average number of problems (more than 525) and excellent references to modern literature that students can find, read, and use, all help to support the text material. Adequate and numerous illustrations combined with a good layout make an attractive volume.

Throughout the book the authors strip away the classical facade at every turn to leave undraped the subjects supposedly foremost in physicists' minds today. The usual classical fanfare is desiccated in the introduc-

tion to quantum physics. Max Planck and Niels Bohr get their due, but the tone for the book is clearly set when a Feynman graph pops up on page 19.

Chapter nine, "Fundamental Particles," is my favorite. Neutrinos, antineutrinos, helicity, magnetic moment of the lambda-zero hyperon, and all eight conservation laws are disclosed. The chapter ends by answering "What is a fundamental particle?" In an eightfold way, the superfundamental particle turns out to be the quark.

The authors explain that "quark" originated from an obscure passage in James Joyce's *Finnegan's Wake*. Joyce, the lover of multilingual puns and hater of wordiness, is considered by some to be the perfect novelist, if only a perfect reader could be found. There's an analogous situation in the book under review. The range and depth of material is certainly what's needed for the bright future graduate students, but plodders—beware!

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Dictionary of diamagnetics

LANDOLT-BORNSTEIN, ZAHLENWERTE UND FUNKTIONEN AUS PHYSIK, CHEMIE, ASTRONOMIE, GEOPHYSIK UND TECHNIK. (6th edition) Vol. 2: Eigenschaften der Materie in ihren Aggregatzuständen, Part 10: Magnetische Eigenschaften II. By W. R. Angus, J. Favède, J. Hoar and A. Pacault. 173 pp. Springer-Verlag, Berlin, 1967. \$26.50

by JOHN H. VAN VLECK

This is the second of two books of the well known Landolt-Börnstein handbook series that is devoted to magnetism. The first one (Vol. II/9), which appeared several years ago, was over five times larger and covered ferromagnetic and paramagnetic components and also nuclear magnetic resonance in diamagnetic compounds. This new volume can be regarded as a supplement to include diamagnetism. The first 135 pages document mean or powder diamagnetic susceptibilities. As most molecules are diamagnetic, an enormous number of exotic components are covered that the average physicist has never heard of, such as,