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discussion would make any text encyclopedic. Although this book is big, it is concise because it describes those essentials by which one learns to think about physical entities quantitatively, "using algebra and trigonometry but no calculus".

There will always be the standard problem of how comprehensive versus how deep or detailed the ramifications of physics should be made in a basic book. This text achieves for the beginner a reasonable compromise between breadth and depth. It is carefully designed, having evolved over a period of years through two previous editions. Not only are the fundamental laws admirably explained; the relationship of these laws to daily living is illustrated in gadgets like the telephone, refrigerator, rockets, and fluorescent lamps; and for human interest there are photographic portraits of scientists whose work delineated the laws of physics.

The very readable text is supported by 604 figures, sketches, graphs, and an index. Pages are numbered in boldface type, and at the top of each page are given the chapter and section number. Numerous tables in the text and in the appendix contribute a substantial amount of factual material. Both for its contents and its format this is a highly recommendable book.

Mechanik. Vol. 1 of Theoretische Physik (4th Revised Edition). By Friedrich Hund. 200 pp. B. G. Teubner Verlagsgesellschaft, Stuttgart, Germany, 1956. Clothbound DM 18.80; paperbound DM 16.80. *Reviewed by S. F. Singer, University of Maryland.*

This is number one of a three-volume presentation of theoretical physics. The second volume dealing with electricity and magnetism, light, and relativity will appear soon. The third volume on thermodynamics and quantum theory has already appeared. The treatment is unusually concise and corresponds in content and difficulty to intermediate textbooks used at the junior and senior level. The book contains no problems but should be very useful as a reference both for instructors and for students.

An Introduction to Cybernetics. By W. Ross Ashby. 295 pp. John Wiley & Sons, Inc., New York, 1956. \$6.50. *Reviewed by J. R. Pierce, Bell Telephone Laboratories.*

An expert can make a fair judgment of a book on a well-worn subject quickly and painlessly. He need only note the general level and coverage, read a few sections to judge the presentation, and check a few key points for accuracy and depth of understanding.

While cybernetics has been tossed about extensively in conversation, it can scarcely be said to be worn with use. And, who are the experts? We have chemistry and chemists, physics and physicists, but are there cyberneticists outside of *The Space Child's Mother Goose*? For that matter, what, indeed, is cybernetics? and where is it to be found? If there is such a thing, it must be lurking in the pages of Ashby's book, but I'm



Here Dr. W. J. Muehlner (left), Dr. H. N. Leifer (center) and Dr. K. F. Cuff discuss properties of solids.

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not sure that I recognize it when I see it. Thus, I feel very inadequate as a reviewer.

Ordinarily, I am against polls and sampling, but in this case I felt justified in consulting others. Two very intelligent and original men commended the book, partly, I believe, because the mode and course of thought paralleled their own. One hardheaded but original man was bored. He would have been pleased with something more substantial and more immediately useful. With some self-doubt and trepidation, I will add my own impressions.

This book says a great deal about the representation of machines, in a very general sense that includes practically everything, by matrices and kinematic graphs or state diagrams. It discusses determinate machines, machines with input, stability, black boxes and the possibility of finding the rules of their behavior, Markovian machines, variety and information theory, and problems of error correction and regulation. In doing this it provides, as in the diagrams and tables representing machines, very useful intellectual tools. It provides also a wealth of entertaining examples or problems in the English style, together with answers which are presumably mostly correct. A person who likes to work puzzles could be hugely entertained by working out any or all of these examples. A person with the interest and diligence to do so would certainly gain a great deal of understanding, and a good deal of skill both in thinking along useful lines and in acquiring and using useful results, such as those of information theory.

The book has two weaknesses. One is that, when the notation has been explained and examples have been given, and when we expect that powerful theorems will be proved, instead, we pass on to something else. This reminds me a little of the eminent American educator who was said to have conducted young ladies into the suburbs of literature—and left them there. The other weakness is that sometimes concepts which are important and not without difficulty are thrown at the reader without words or examples adequate to orient his thinking. This happens in the case of normal coordinates, on page 101.

The last chapters, leading up to the "amplification of intelligence", are admittedly speculative.

Ashby's preface addresses his book to physiologists, psychologists, and sociologists. I would think that a good deal of the information and modes of thought in the book could be of considerable use to them. Indeed, Ashby may well lead his fellows to the Promised Land.

Les Dislocations. By J. Friedel. 314 pp. Gauthier-Villars, Paris, France, 1956. Clothbound \$11.05; paperbound \$10.20. Reviewed by R. Smoluchowski, *Carnegie Institute of Technology*.

Anyone who has had contact with the theory of dislocations has been awaiting with great interest the appearance of the recent book on dislocations by Friedel. Not only is the author well known for his many fundamental contributions to theory of solids and to the the-