

Book Reviews

An Introduction to On-Line Computers. By W. W. Black. Gordon and Breach Publishers (1971). 449 pp. \$18.00 pre-paid.

Dr. Black's book is a unique contribution to the literature of computers. Written in a plain down-to-earth style, this book is a highly successful attempt to tell how things really are with computers. I was particularly taken with the simplicity of the book's format: the pages are reproduced directly from typewritten copy and the drawings are generally freehand. This unsophisticated presentation seems quite as clear to me as the slickest product of the publisher's art. Unfortunately, the scanting of frills extended into the editing and proofreading phase. There are many crudities in writing which should have been corrected. The author's style, however, is generally straightforward and devoid of computer jargon; most readers should find it easy to overlook the occasional lapses.

The book is divided into four major sections. In the first, a general survey of the subject is presented. The author says that on-line computers are often defined as computers which control a device, a process, or an experiment. Other descriptions have been given, but he finds them too confining; he prefers to think of such computers as simply versatile tools whose utility is limited only by our ingenuity. On-line computers are characteristically used in particular situations—traffic light control, airline reservations, hospital patient monitoring, and so on—where immediate response is of prime importance. Besides this specialization of use, such computers are contrasted with general purpose central-facility computers by their smaller size and cost and their mobility. Test applications and trends are briefly discussed and conjectures and proposals on future lines of development are outlined. Three particular needs are noted: standardization of interfaces, that is, of the ways in which peripheral equipment is linked to the computer; simplification of programming by programming language improvement; and reduction of the need for programming by improvements in hardware. A chapter on number systems, conversion from one base to another, and arithmetic procedures follows. The second section, "On-Line Computer Fundamentals," starts out with a general description of an on-line computer system from the user standpoint. The next three chapters discuss programming, editing, assembling, and de-bugging, with practical illustrations taken from PDP-8 programming. The section concludes with a lengthy chapter on computer organization, describing how logic is carried out by circuitry. Boolean algebra, flip-flops, computer register, input-output operations and the like are discussed. The third section of the book, "On-Line Computer Utilization," discusses the various peripheral devices which may be used with the computer. Teletypes, paper tape, magnetic tape, disks, drums, oscilloscopes, printers, and plotters are briefly discussed with illustrations of use. More programming ex-

amples are given. The final section of the book covers the problems of choosing computer systems and, briefly, conversational languages.

There has been an endless making of many books about computers in recent years and all of the material above can be found in the mountain of literature which already exists. What is different about this book is its common-sense approach, the numerous suggestions, illustrations, and advice borne out of day-to-day experience. Despite its flaws in writing style, it is well worth reading.

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About the Reviewer: Melvin L. Tobias has been in the Reactor Division of Oak Ridge National Laboratory since 1950. He has been concerned with heat transfer research, the measurement of physical properties of reactor materials, reactor analysis, and the development of neutron diffusion and cross-section preparation codes. Currently, he is working on the neutronics aspects of fusion reactor technology.

Dissociation in Heavy Particle Collisions. By G. W. McClure and J. M. Peek. John Wiley and Sons, Inc. (1972). 198 pp. \$13.95.

Dissociation in Heavy Particle Collisions was written as one of a series to critically review data in specialized topics of heavy particle atomic and molecular collisions. In their preface the authors note that the book "is intended to aid scientists, engineers, and students who require information on the dissociation of molecules induced by collision with other 'heavy' particles, including atoms, molecules, and ions. It is an index to the scientific literature and a guide to the understanding and evaluation of the literature rather than a data compilation." These remarks quite accurately represent the book, and the authors have done a commendable job in meeting their goals.

One half of the relatively short monograph consists of tables which give a thorough index to the dissociation literature. Thus, Chap. 4 contains a large table indexing the experimental literature by projectile species, target species, energy range, observed dissociation products, measurement classification, and data classification; the table also contains page numbers and figure or table numbers where the data are located in the original papers. The theoretical literature is also indexed in tables with convenient classifications by collision partners, dissociative modes, and final states. These papers are also