Books

Introduction to Information Storage and Retrieval: Tools, Elements, Theories, by Joseph Becker and Robert M. Hayes

Published (1963) by John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 425 pages+18 index pages+xi pages+4 bibliography pages. Illus. 6×9. $11.95.

Written for the newcomer to "information retrieval," this popular style book touches on a great diversity of topics: librarianship and documentation, advances in the printing art and conversion of print to machine language, hardware for digital and microform storage, matrix algebra, file organization problems, and many others. It may prove useful to the newcomer seeking an overview of what information retrieval is about; he is likely to find that the area has undefined boundaries and is quite unstructured.

The book is impressive by how much it attempts to cover. Yet, it could still not qualify as a complete reference work. Many of the ideas described in the book—for example, stress on continually fitting the organization of stored responses to that of the environment—had been made earlier in the literature, and with greater precision. More complete tabular charts comparing available equipment, discussing the rate of libraries and information centers, compiling user requirements, etc., had all been published in the serial literature.

Furthermore, the extremely broad coverage of the book is attained at a price in unity, depth and critical evaluation. For example, there are short passages alluding to lattice theory, to stochastic process, to the transportation problem, but there are only weak links to the central theme of the book. Little guidance to priorities, to key problems, or to essentials is given to the newcomer. He is likely to be bewildered and impressed more by the extent of diversity than by the over-all logical structure of the ideas and problems or the utility and limitations of current developments. He will have to supply his own judgment.

The authors are hardly to blame for this. They have accurately portrayed the state of thought in this field.

Occasional insights seem quite important and suggestive, and these should be brought to the attention of many workers in the field. Some examples are: "the fundamental aim of the user of an information system generally is to make decisions"; or that there is "a basic need for analysis to determine the legitimate role of mechanization of logical processes, to understand the basic problems in mechanizing the file system itself"; or "semantics has no relevance to mechanization."

The book is intended as a road map to guide the newcomer—not the beginner—through a maze of scattered developments. By virtue of its clear style and broad coverage, the book meets this objective.

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Propagation and Instabilities in Plasmas, edited by Walter I. Futterman

Published (1963) by Stanford University Press, Stanford, Calif. 144 pages+references by chapter. Illus. 6×9. $4.50.

The Lockheed Symposia series, of which this is the seventh volume, has become a regular source for the plasma specialist, rather like Advances in Electronics for the electronic scientist. This volume consists of nine articles, mostly of review character, but it is more than a collection of articles by individuals: there is noticeable homogeneity of material through the first 70 per cent of the book.

To make a collection of individual conference papers into a book rather than a journal issue is a hard task for the editor; he well deserves having his name on the spine.

The first six contributions are strictly concerned with the subject matter indicated by the title; the last three, "Energy Transfer in a Dense Plasma," by J. A. Fay, "Optimization of Flowing-Plasma and External Circuit Interaction," by M. G. Haines and W. B. Thompson, and "Experiments on the Upstream Wake in Magnetofluid Dynamics," by H. G. Ahlstrom are a bonus somewhat outside the main topic.

S. J. Buchsbaum's "Waves in Uniform Magnetoactive Plasmas" is a well chosen introductory article: it puts the many plasma waves on a map (the famous Allis-Buchsbaum-Delcroix butterfly diagram shown in color) and regulates their nomenclature. The only drawback of this presentation is that it does not link easily with the well developed "hot" plasma theory.

R. A. Helliwell's review on "Whistlers" emerges appropriately out of one corner of Buchsbaum's map, and although there are differences of notation between laboratory plasma specialists and ionosphere experts, there is coherence between Buchsbaum's and Helliwell's contributions—even to the extent of mutual references, a rare occurrence in a multiauthor book!

E. A. Friedman and S. E. Bodner in their "Quasi-Linear Theory of Plasma Oscillations and Instabilities," introduce the hot topic of "weak" plasma instabilities. Doubly approximate procedures (*i.e.*, two expansion parameters) are necessary in the analysis of these instabilities. The authors bring some order into the subject by systematically distinguishing which quantities are "small" compared with which others when such procedures are employed.

G. Rowlands in his review of some of the "Theoretical Plasma Studies in the United Kingdom" makes up for a serious credit emission in the preceding article, namely to T. E. Stringer. The review also gives prominence to F. D. Kahn's renewed instability studies, but on the whole one notices a bias toward AEA sponsored work—even to the extent of quoting fusion oriented research in the U. S. when earlier U. K. produced university research ought to have been acknowledged. However, as a brief survey of a well-balanced theoretical program on plasma waves and instabilities, this article is most useful.

B. Coppi's "On the Stability of Hydromagnetic Systems with Dissipation" and H. P. Furth's "Hydromagnetic Instabilities Due to Finite Resistivity" are complementary articles on a topic which has recently acquired considerable importance in fusion work. Coppi is strongly analytical, while Furth is more phenonenological. Many readers may prefer to look at the second article first. One should again be prepared for changes of notation in switching from one to the other. There is some interaction between the two contributions (Coppi refers to Furth), but more would have been desirable.

Throughout, when reading Lockheed Symposia texts, one should remember that the authors will have prepared their material before meeting and hearing each others' contributions. This in mind, one will find this seventh volume edited by Futterman a useful text. Those who want to treat the volume as a journal issue will find the introductions to the chapters adequate abstracts.

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Linear Network Design and Synthesis, by Wayne H. Chen

Published (1964) by McGraw-Hill Book Co., Inc., 330 West 42 St., New York, N. Y. 793 pages+8 index pages+xv pages. Illus. 6×9. $23.50.

This weighty tome, of approximately eight hundred pages, is devoted to the classical, academic synthesis of passive, lumped-constant two-terminal and two-port networks. It presents, in meticulous and exhaustive detail, an encyclopedic and complete compendium of probably everything of significance that has yet appeared in print to do with passive synthesis concepts, properties and realization of two-terminal networks, two-port insertion-loss filter design, the approximation problem via potential analog, and two-port transfer function synthesis, with a particularly exhaustive exploitation of ladder and lattice networks.

The existence, if not the intimate detail, of all of this material is well known to the average practitioner in circuit theory, including, as it does, the volume of findings which have accumulated around and beyond the classical key contributions of Cauer, Bode, Darlington, Foster, Brune and Guillemin. Thus, the contribution of this work is in the complete and fastidious manner in which so much has been catalogued, with rarely a wasted word, within a single cover. Since, in the opinion of many, both within the classroom and without, the popularity which lumped-constant network