

erly being "On Books and Reading," four essays which affirm his belief in the future of the book and the necessity of reading. A later section "on the Unity of Library Media" advocates a unified materials center, long before the term was generally used in schools.

His lifelong interest in reference service is reflected in two sections: "On Reference Librarianship" and "On Reference Sources." In the former he predicted "that in the very next few years the reference librarian will emerge as the most strategic professional in our entire family of world occupations." That was in 1957. The other contains the earliest essay in the volume, one on Noah Webster's Dictionary, written in 1928. His article on the ideal encyclopedia, published first in 1937, accurately predicts the trends in publishing which have taken place in the past twenty years.

The author's long involvement with library education and his visions of the future are evident in six essays written between 1953 and 1964, under "On Library Education." His optimism shines through in "What Is Right With Library Education," his view of its objectives is set forth in "The College of Library Art, 1984."

Those aware of Dr. Shores's current interest in the library arts college may have forgotten that early in 1935, *School and Society* published "The Library Arts College: A Possibility in 1954?" This is one of the ten essays in the section, "On the Library's Role in Education," which also includes the title essay, "Mark Hopkins' Log." It is not surprising that he identifies the Log as "the universe of the materials of learning," a point reiterated in "The Essence of Learning," in which he states his belief that the book, in its broadest interpretation, is the composite of the school curriculum, and that a better course of study would result if the curriculum followed the book instead of the other way around.

Of necessity there is some unavoidable repetition in the essays, but this does not detract from their usefulness as a source of inspiration to library school students as well as to librarians who view their profession with a somewhat more jaundiced eye than Dr. Shores. For Dr. Shores, like Vachel Lindsay's calliope, is "tooting joy,

tooting hope," if not in such raucous notes. —*Frances Neel Cheney, George Peabody College.*

Annual Review of Information Science and Technology, Ed. by Carlos A. Cuadra. Vol. II, New York: John Wiley, 1967. 484p. \$15. (66-25096).

This volume is the second in a series of annual reviews, but it is much more than that. With quality of exposition, comprehensiveness of coverage, and clarity of organization, it and its predecessor have created a discipline where previously there was only an amorphous, ill-defined area of interesting problems. As a result, the two together do credit to the National Science Foundation and the System Development Corporation, which provided the resources, and to the American Documentation Institute which provided the professional support. Full honor is due the individual authors, but more than usual is due the editor for the superb quality of this volume. He provided more than simply editorial guidance. He created an entire mechanism—for definition of the structure and coverage, for accumulation of the relevant references, for selection of the reviewers, for critical evaluation and re-evaluation of their analyses, for assembly and production of the final volume.

For the purposes of this review, the fourteen chapters can be divided into four groups: the first three, which present the design techniques; the next five, which present the technical techniques; the next four, which present areas of application; and the last two, which present the social and professional context.

In group 1—

1. Information Needs and Uses in Science and Technology, by Saul and Mary Herner;
2. Design of Information Systems and Services, by Harold Borko;
3. Evaluation of Information Systems and Services, by Alan M. Rees.

These are excellent summaries of the state of the art, "critical" in the best sense of the word. The evaluations can be summarized by the words of the writers: "relatively few techniques used," "lack of innovation," "failure to build on past gains

... (and) profit from past mistakes," "absence of rigorous experimental designs," "reports on the issues . . . and the problems to be solved rather than on specific procedures for solving them," "continued existence of nagging methodological and conceptual problems." The design and evaluation of information systems to serve the needs of users is apparently still an art and does not have a large kit of tools to draw on. Developing new tools or learning how to apply the old ones better is a slow process.

In group 2—

4. Content Analysis, Specification, and Control, by John R. Sharp;
5. File Organization and Data Management, by Jack Minker and Jerome Sable;
6. Automated Language Processing, by D. G. Bobrow, J. B. Fraser, and M. R. Quillian;
7. Hardware Developments and Product Announcements, by Andries van Dam and James C. Michener;
8. Man-Machine Communication and Problem Solving, by R. G. Mills.

The growth of techniques for solution of specific technical problems, as summarized in these five chapters, presents an interesting contrast with the dearth of techniques for design. Thesauri, statistics, classifications, roles and links, citations, abstracts, etc.—all are tools for handling the description of document content. They may be of varying utility, but each can be used. The recent work on each is reviewed with real insight in Chapter 4. The variety of possible file structures, methods for linkage among records, and file indexing techniques is also great. Particularly important therefore is the growing number of "task-oriented" programs, reviewed in Chapter 5, which can handle these structures. The magnitude of the problems represented by "automated language processing" is great; it is therefore not remarkable that Chapter 6 concludes that "no great stride forward has been made this year." On the other hand, the technology continues to progress, as the report in Chapter 7 amply demonstrates. As a result, the chapter concludes "that the largest problems . . . are not those of choosing components but continue to be the intellectual ones." (Parenthetically, it

might also have been mentioned that the problems encountered in conversion to "third generation hardware" over the last two to three years have been predominantly due to software limitations.) Of particular interest is the evaluation that "the central processor, time-shared by small remote computers, holds most promise." Chapter 8 brings this point into sharp focus, as it presents the status in development of large scale "multi-access" systems and concludes they "have been developed to only a relatively primitive level."

In group 3—

9. Automation in Libraries and Information Centers, by Barbara Evans Markuson;
10. Handling Chemical Compounds in Information Systems, by F. A. Tate;
11. Applications in Medicine, by William C. Spring, Jr.;
12. Techniques for Publication and Distribution of Information, by the staff of the American Institute of Physics.

Chapter 9 is, of course, of special interest to the readers of *CRL*. It is excellently written and emphasizes what the author regards as "the single most important facet . . . the vast and growing number of marchers." Chapter 10 reports on applications in chemistry, which historically has had the best developed means of access to scientific literature and still is at the forefront in the actual use of the computer as well as in its intellectual base in notation. However, the National Library of Medicine has perhaps accomplished more than any other single agency in demonstrating what computers can do in support of *library* services and is leading the way in its efforts to establish a national medical information system. The final application presented—publication—represents one of great importance, since it provides the means of justifying the input costs in large-scale information retrieval systems. The great variety of hardware techniques listed and the number of data bases being created as a by-product all attest to the increasing importance of computer based publication.

In group 4—

13. National Information Issues and Trends, by Donald P. Hammer;
14. Professional Aspects of Information