Research and Developments in Documentation

JESSE H. SHERA

He who undertakes the task of describing research in librarianship soon finds himself in a position not entirely dissimilar to that of the German scholar who began his two-volume treatise on "The Snakes of Ireland," with the assertion "Strictly speaking, there are no snakes in Ireland." To the often-repeated charge that there is very little research in librarianship the field of documentation is scarcely immune.

"Research" is, of course, a slippery word, and all that masquerades under that title is not properly so. As here defined, research is that form of human activity whereby answers are sought, with as great an approximation of truth and accuracy as human knowledge makes possible, to basic or fundamental questions concerning the phenomena of the universe. Research is not concerned with the trivial and unimportant; it is much more than mere fact-finding; it is pursued by means of the application of certain accepted methods or procedures which, in the light of experience, seem most likely to produce truthful results, and its end is the advancement of human understanding.

The building of a new machine or the designing of a new system is not research; it is invention or development, though it may be based upon the findings of research. The ascertaining of a well known fact—i.e. the atomic weight of silver—is not research but "reference work," though the fact revealed may, at one time, have been the product of research. The promulgation of a questionnaire and the tabulation of the answer are not research, though they may occupy valid places in the research process. Research is usually thought of in terms of analysis, though synthesis may also play a vital role in the research process. Therefore, to be identified as such, research is to be known by the materials it works upon, the methods it employs, and the ends it seeks. It is governed only by the principles of integrity and objectivity, and it rejects all authority except that of valid evidence.

Mr. Shera is Dean, School of Library Science, Western Reserve University.
erly used it lies at the very foundation of all knowledge and understanding; prostituted, it becomes only a sacred cow that gives no milk.

The third element in the title to the present essay, "documentation," refers to that form of bibliographic organization, or librarianship if you will, that is concerned with the systematic mobilization of the total graphic resources of society for improving the scholarship of the culture. Stated somewhat more precisely documentation may be defined as that aspect of librarianship which is concerned with the organization and dissemination of graphic records for their most efficient use within and among groups of specialists to the end that they will receive, in a manner as effective as possible, the data and other information that they require for the prosecution of their work. In this ancient catalysis between man and the written word the documentalist and the librarian are specialists, each in his own right, in the communication of recorded information. The investigator, or research worker, and the documentalist, then, are both engaged in activities directed toward the advance of human knowledge, the one with extending the boundaries of knowledge and the other with making that knowledge more socially useful. They are natural partners in a team dedicated to the advancement of human understanding.¹ In a world in which progress is so heavily dependent upon the effective use of recorded information, why has so little attention been directed toward those forms of research that will increase man's understanding of the ways in which knowledge grows and is utilized and the methods by which the processes of utilization may be augmented and improved? The past record of research in documentation and librarianship is not one to inspire confidence in an early solution to the many vexing problems which must be solved before the swelling flood of graphic records is effectively harnessed.

This essay describes trends in current research in documentation through an analysis of research in progress. During the past year, two surveys of research and development in the field of documentation have been conducted. One was the work of Mrs. Helen L. Brownson and Miss Madeline M. Berry of the Office of Scientific Information of the National Science Foundation, the other was prepared by the Committee on Research and Development of the American Documentation Institute, under the direction of the committee chairman, Saul Hernandez of Hernon, Meyer & Co., Washington, D.C. To both of these surveys the present writer is heavily indebted, though to their data he has made some additions of his own. (The National Science Foundation
Research and Developments in Documentation

survey was prepared for internal use and has not been published. The report of the A.D.I. Committee, which makes extensive use of the N.S.E. study, is scheduled for publication in American Documentation, and it is the hope of the Herner Committee that its survey will be continued on an annual basis.)

Probably no survey of research in progress is ever entirely complete; there is always at least one significant project that lies quietly hidden only to arise wraith-like from its self-inflicted obscurity to haunt the compiler at the most embarrassing moment. Nevertheless, sufficient care has been expended on this listing to make it a reasonably reliable source for identifying the general contours of current research and development in documentation.

The present roster lists seventy-six studies in progress, or just completed, as of the end of the first quarter of the present calendar year. In addition to the data compiled by Mrs. Brownson and Miss Berry of the National Science Foundation, inquiries requesting information on studies in progress were sent to sixty scientific, technical, and professional societies; to deans or directors of approximately fifty library schools; to the editors of an equal number of library and documentation journals; and to twenty-four industrial firms known to be actively interested in the field. The tabulation indicates that, numerically, the burden of research and development in documentation is being largely carried on at the library schools and at industrial and business organizations. The figure for the library schools is, however, very deceptive in as much as there is a heavy concentration of work in a limited number of institutions.

Only nine projects are listed as being directly under government auspices, but this figure, too, must be judiciously interpreted, because many of the other projects being carried forward by both profit and non-profit organizations are subsidized by substantial grants from the federal government. It would seem to be conservative to say that probably more than seventy-five per cent of the work in this field is government supported; and, in terms of dollars invested, the proportion might well be even higher. It is interesting that only one public library has listed a project, yet in many of the larger metropolitan libraries the opportunities to study and make use of documentation techniques are manifold. This lack of interest on the part of "traditional librarianship," in the new potentialities inherent in documentation may explain why practicing librarians seem to be contributing little to the development of this field.

[ 189 ]
The survey included, in accordance with pre-determined policy, those "projects involving research, development, or testing in eight aspects of documentation—organization, processing, production, dissemination, storage, retrieval, equipment, and use and user needs." The final listing has been categorized by the Committee into eight classes which, in general, conform to the above areas, but which are not entirely mutually exclusive or discreet.

TABLE II

Classification of Research Projects by Subject Groups

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Information and User Requirements</td>
<td>17</td>
</tr>
<tr>
<td>Indexing, Cataloging, and Classification</td>
<td>14</td>
</tr>
<tr>
<td>Coding for Mechanized Searching Systems</td>
<td>13</td>
</tr>
<tr>
<td>Equipment for Information Storage, Retrieval and Reproduction</td>
<td>12</td>
</tr>
<tr>
<td>Theory</td>
<td>8</td>
</tr>
<tr>
<td>Mechanical Translation</td>
<td>6</td>
</tr>
<tr>
<td>Production and Dissemination of Published Information</td>
<td>5</td>
</tr>
<tr>
<td>Education and Training for Documentalists</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>

Perhaps the most striking characteristic of the data in Table II is the relatively even frequency distribution of subjects throughout the major portion of the range. The very sharp drop-off in studies of theory is to be anticipated because of the relative difficulty in obtaining financial support for such investigations. Here is a lesson which those charged with responsibility for supporting research in documentation should heed. Though the study of the use and user requirements
Research and Developments in Documentation

constitutes the largest single category, it is still relatively small in comparison with the amount of attention being given to the design and construction of systems and related problems and techniques for making information available. This would seem to suggest that, like other librarians, documentalists have been quite willing to hypothesize use and to construct systems and devise techniques based on such hypotheses without objective knowledge of the ends to be met.

Perhaps, however, the most startling development revealed by these statistics, to one who has been associated with the documentation field for almost thirty years, is the shift in emphasis. Twenty years ago such a report as this would have portrayed great interest in methods of photographic reproduction, especially microphotography, and allied techniques. This is certainly no longer true, so far as the professional documentalists and librarians are concerned. Today the major burden of research and development in the areas of photographic reproduction have been largely assumed by the commercial manufacturers and their own professional organization, the National Microfilm Association. The Microphotographic Laboratory, established in the late 1930's at the University of Chicago by a grant from the Carnegie Corporation to explore, through an active research program, the potentialities inherent in microfilm and allied techniques, has long since abrogated its original mandate and become little more than a service agency for the sale of film. The same is true for the laboratory, established under a similar grant, at Massachusetts Institute of Technology. Thus, the day, when documentation was equated with microphotographic reproduction, has yielded to a new period in which the emphasis is on systems for information retrieval. Thus, too, did the original Journal of Documentary Reproduction re-emerge after the Second World War as American Documentation, with a considerably broadened scope.

No one would pretend, least of all the editor, that American Documentation accurately reflects the state of research among American documentalists. Nevertheless, an analysis of its contents over the past seven years gives some clue to the general pattern of interests in the field from which research activity and projects originate.

As Table III indicates, the dominant position of contributions dealing with the production and dissemination of recorded information is to be interpreted largely in terms of the early emphasis on microphotographic techniques. In more recent years there has been increasing attention given to indexing and other information retrieval systems, and to the coding of material for use in such systems. Articles on
### TABLE III

*Distribution of Articles in American Documentation, by Subject, 1950-1957*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production and Dissemination of Published Information (Including Editing)**</td>
<td>16</td>
<td>22</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>61</td>
</tr>
<tr>
<td>Indexing, Cataloging, Classification, and Abstracting</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>General Surveys, Descriptions, and Bibliographies</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>—</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>Coding for Mechanized Searching Systems</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Theory</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Equipment for Information Storage, and Retrieval</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Use of Information and Use Requirements</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>2</td>
<td>—</td>
<td>2</td>
<td>—</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Education and Training</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Mechanical Translation</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
<td><strong>203</strong></td>
</tr>
</tbody>
</table>

* Includes only issues for January, April, and July.

** Prior to the beginning of 1952 this item was almost entirely confined to problems in the production of microfilming and microfilming techniques, after that date there appeared relatively little on microfilming with considerable more attention to problems in dissemination, security, editing, etc.
### TABLE IV
**Distribution of Articles in the Journal of Documentation, by Subject, 1945-1956**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Surveys, Descriptions, and Bibliographies</td>
<td>12</td>
<td>5</td>
<td>14</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td>Indexing, Cataloging, Classification, &amp; Abstracting</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>—</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>47</td>
</tr>
<tr>
<td>Production and Dissemination of Published Information</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>—</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>20</td>
</tr>
<tr>
<td>Planning of Documentation Centers, Libraries, etc.</td>
<td>—</td>
<td>5</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>6</td>
</tr>
<tr>
<td>Theory</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>2</td>
</tr>
<tr>
<td>Coding for Mechanized Searching Systems</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>2</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Education and Training</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Equipment for Information Storage Retrieval</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Mechanical Translation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Use of Information and Use Requirements</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Preservation of Materials*</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>168</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Category does not appear in Table III.
equipment, mechanisms, and machines are, perhaps, fewer in number than one might expect. Over the years there has been a steady, but modest concern with theory. Though perhaps, one must admit that much of it might better be characterized as "theorizing," since conclusions are based more upon speculation and opinion, or conjecture, than upon any really fundamental research. Finally, the attention being paid to studies of use and use requirements is disappointingly small. Yet the vexing question still persists: How can effective systems be devised without a solid understanding of the uses to which they are to be put? Despite its position in the table, mechanical translation is arousing considerable interest among documentalists, but there are media other than American Documentation for the publication of work in this field that are better suited to its needs. Finally, in view of the great demand for documentalists at the present time, it is regrettable that more attention is not being paid to the study of their professional education and training.

The charge that a journal inevitably reflects the interests, enthusiasms, and biases of its editor is unquestionably valid, and American Documentation has had to endure no less than three in its eight short years of life. (V. D. Tate, 1950-51; Mortimer Taube, 1952; and the present writer from 1953.) Nevertheless, if one were to superimpose upon the pattern of contributions published in this journal, a profile of the subject distribution of papers presented at the annual meetings of the American Documentation Institute there would probably be no very significant variation. When documentalists meet they talk, in general, about the same topics concerning which they write and publish.

Table IV presents a comparable tabulation of subject distribution for the British Journal of Documentation which evinces some striking contrasts to its American counterpart. British concern with problems of classification stands out in marked contrast to the relative neglect of this fascinating subject by their cousins on this side of the Atlantic. They have also published a greater proportion than we have of articles describing documentation installations, surveys of the several aspects of the documentation field, and subject bibliographies. On the other hand, American documentalists have emphasized the design of systems, with particular emphasis on coding and the construction of codes for specific purposes. Both have seriously neglected basic theory, studies of use, and the professional education of documentalists. Research, as defined at the beginning of this discussion, is poorly represented in both tables. Americans, perhaps, because of their insatiable
Research and Developments in Documentation

appetite for gadgets and mechanisms, have emphasized, much more strongly than the British, the techniques of documentary reproduction, especially microfilm and micro-opaques. The typical American documentalist, too, has almost an aversion for traditional methods, whereas in England, published materials treat some aspects of traditional librarianship as properly belonging in the province of the documentalist. This may, in part, be explained by the fact that in the United States the Special Libraries Association and the American Documentation Institute are separate and distinct organizations, in Great Britain the two are united in a common organization, Aslib, which sponsors the Journal of Documentation. Even the point of view of the archivist has infiltrated the documentation field in England, and there is some consideration, in the pages of the Journal of Documentation, of the problems of document preservation and repair. It may well be that the documentalist and the archivist have much more in common than is generally realized, at least among Americans.

Finally, and distressingly, both groups know that it is far safer and easier to describe, than it is to analyze, measure, and evaluate, and that speculation is more intriguing than the slow tedious drudgery of research.

From the sources mentioned in the preceding pages, the following roster of current research and development projects in documentation has been prepared. It represents, in so far as is possible, the situation as of April 1, 1957. The descriptions are given as presented by the respective authors.

Coding for Mechanical Searching Systems

A study of means for organizing the subject content of patents to make them amenable to machine searching. (D. C. Andrews and B. E. Lanham, and Associates, U.S. Patent Office)


The development of a mechanical searching code by means of an analysis of a significant sample of the collection being organized, the collection of concepts into related classes, and preparation of a thesaurus-like index to the documents. (H. P. Luhn, Engineering Laboratories, International Business Machines Corporation, Endicott, N.Y.)

The study of structural relationships between the ideas in documents in large collections, with a view toward making indexing codes more amenable to mechanical searching devices. (Calvin Mooers, Zator Co., Cambridge, Mass.)

Coding system for the mechanical storage and retrieval of information on chem-
JESSE H. SHERA


The development of a general searching system embodying completely automatic conversion of the language of a reference to its syntactic-topological equivalent and retrieval by high-speed, large capacity, computing machines. (same)

The development of a machine language for information storage and retrieval (J. W. Perry and Allen Kent, School of Library Science, Western Reserve University, Cleveland, Ohio)

Study of mechanical aids in special classification systems. (Allen Kent, J. H. Shera, Western Reserve University, and Classification Committee of the Special Libraries Association)

The encoding of classification systems for mechanized searching and correlation. (Rosella Busemeyer, in collaboration with Center for Documentation and Communication Research, Western Reserve University.)

The encoding of subject indexes for mechanized searching and correlation. (same)

The indexing and coding of metallurgical literature for testing the possibility of searching by means of computer-like devices. (Perry and Kent, same)

Comparative evaluation of coding schemes for mechanized information storage and retrieval systems. (W. J. Turanski, Remington Rand Univac, Philadelphia, Pa.)

The design of mechanized storage and searching system for agricultural chemical information. (W. M. Waldo, Monsanto Chemical Co., St. Louis, Mo.)

Equipment for Information Storage, Retrieval, and Reproduction


The development of a device for the selection of specific frames on a microfilm reel, and the development of a code for identifying and searching frames. (L. M. Bohnert, Federal Telecommunications Laboratories, New York, N.Y.)

The development of a "data-taking" and "date-retrieving" mechanism which duplicates the perceptual, motor, and mental function of the human nervous system. (J. R. Bussey, Sandia Corporation.)


The development of the Minicard system of information storage and retrieval. (Eastman Kodak Co., Rochester, N.Y.)

The development of a microimage data storage and retrieval device that provides rapid access to information-containing frames recorded in miniature on a ten-inch square sheet of microfilm, automatically searching the microfilm, and printing out one frame every two seconds. (M. L. Kuder, U.S. National Bureau of Standards, Washington, D.C.)

[ 196 ]
Research and Developments in Documentation

A high-speed printer, utilizing ferromagnetography. (Robert D. McComb, General Electric Company, Schenectady, N.Y.)


The design and construction of an experimental computer-like machine for testing mechanical searching codes. (J. W. Perry and Allen Kent, School of Library Science, Western Reserve University, Cleveland, Ohio)

Study of automatic correlation of recorded information for purposes of commercial intelligence. (Staff, Center for Documentation and Communication Research, same.)

Development of an association of ideas machine. (Mortimer Taube, Documentation Inc., Washington, D.C.)

The development of a combination of a "Peek-a-Boo" searching system using microfilm. (W. A. Wildhack and J. Stern, Division of Basic Instrumentation, U.S. Bureau of Standards, Washington, D.C.)

Indexing, Cataloging, and Classification

The conversion of manipulative indexes, such as punched cards, into non-manipulative indexes in book or catalog card form. (Charles L. Bernier, Chemical Abstracts Service, Columbus, Ohio)

A study of the syntax and morphology of subject headings. (J. E. Daily, School of Library Service, Columbia University, New York, N.Y.)

The indexing of publications in psychiatry, psychoanalysis, and mental health. (A. Grinstein, M.D., 18466 Wildermere Ave., Detroit 21, Mich.)


The drafting or adaptation of a classification scheme suitable for the arrangement of entries of bibliographies in the Social Sciences. (Barbara Kyle, Social Science Documentation, London, W.1, England)

An analysis of the index to the Canadian Labour Gazette to determine the use to be made of it, the user's needs, and means for improving the Index. (B. Land, Library School, University of Toronto, Toronto, Canada.)


A study of the cataloging of publications in microfilm form. (S. Ross, Library School, Florida State University, Tallahassee, Fla.)

[197]
JESSE H. SHERA

Development of an indexing abstracting system for Development and Proof Services, Aberdeen Proving Grounds. (J. W. Perry and Allen Kent, Western Reserve University, and Madeline Berry, National Science Foundation, Washington, D.C.)

Revision of subject headings for Dissertations Abstracts, University Microfilms, Inc. and Association of Research Libraries. (Robert Booth, School of Library Science, Western Reserve University, Cleveland, Ohio.)

Association of ideas in indexing. (Mortimer Taube, Documentation Inc., Washington, D.C.)

A study of the principles of classification and indexing. (B. C. Vickery, Imperial Chemical Industries, Akers Research Laboratories, Welyn, Hertz, England)

Mechanical Translation

A study of codes necessary for mechanical translation. (E. Dostert, Institute for Language and Linguistics, Georgetown University, Washington, D.C.)

The development of a memory device to be used for a mechanized Russian-English dictionary. (G. W. King, International Telemeter Corporation, Los Angeles, Calif.)

The design of a mechanical translating process which will make possible the translation of foreign language material into precise stylistically current English without human editing. (A. Koutsoudas, Project Michigan, University of Michigan, Ann Arbor, Mich.)

The automatic encoding of terminology. (Staff, Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland, Ohio)

The development of a machine memory for the automatic translation of Russian into English, and the preparation of an index to a Chinese dictionary, to serve in the future for machine translation projects. (E. Reifler, University of Washington, Seattle, Wash.)

The analysis of German for mechanical translation. (V. H. Ingve, Massachusetts Institute of Technology, Cambridge, Mass.)

Production and Dissemination of Published Information

The distribution of meteorological data on Microcards. (O. M. Ashford, World Meteorological Organization, Geneva, Switzerland.)


A study of the need for preserving primary scientific records in anthropology and psychology. (B. Kaplan, National Academy of Sciences, National Research Council, Washington, D.C.)

Canadian Library literature indexing project. (Irene McAfee, Canadian Library Association, Montreal, Canada.)

[ 198 ]
Research and Developments in Documentation

The bibliography of Newfoundland and Labrador. (Agnes C. O'dea, study being conducted under a grant from the Carnegie Advisory Committee for Newfoundland Historical Research, Memorial University of Newfoundland)

The Use of Information and User Requirements

A feasibility study to determine the possible application of operations research methods and techniques to devising means for the improvement of scientific information. (R. Ackoff, under grant from the National Science Foundation, Operations Research Group, Case Institute of Technology, Cleveland, Ohio.)

A study of public library reference services including an investigation of the types of use made of such services. (Frances N. Cheney, Library School, George Peabody College, Nashville, Tenn.)


A study of the use of domestic and foreign information by American medical scientists. (Same)

A study of user language, viewpoints, and information requirements by means of the analysis of reference questions. (same with S. Herner)

A questionnaire survey of the use of the library catalog. (S. Jackson, Brooklyn Public Library, Brooklyn, N.Y.)

A survey of the ways that industrial and governmental organizations obtain access to recorded information to support the decision-making processes in the planning and administration of business and research. (Allen Kent, Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland, Ohio)

Survey of centralized vs. individual information processing, abstracting and indexing, in the United States. (Same with Robert Booth)

Study of documentation needs of members of American Chemical Society. (same with Division of Chemical Literature of the American Chemical Society)

An analysis of the variety of services offered to scholars in the development of special collections, use of interlibrary loans, utilization of microfilm and other media, as well as the problems of availability and accessibility of research materials. (M. Kroll, Library School, University of Washington, Seattle, Wash.)

A survey of the documentation resources available to social scientists in the libraries of London, and possibly elsewhere in the United Kingdom. (Barbara Kyle, Social Science Documentation, London, W.1, England)

An investigation of possible relationships between creativity and information seeking patterns among a group of chemists in an industrial research laboratory. (R. D. Maizell, Olin Mathieson Chemical Co.)

An interview analysis of the flow of information among scientists in chemistry, biochemistry, and zoology. (H. Menzel, Bureau of Applied Social Research, Columbia University, New York, N.Y.)

An operations research analysis of library operations and library use. (P. M. Morse, Massachusetts Institute of Technology, Cambridge, Mass.)
A study of the literature resources in psychiatry, with the objective of defining research problems in this area. (T. H. Rees, Jr., Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland, Ohio.)

A study of the possibility of diary methods to ascertain the information-gathering habits of scientists. (Ralph R. Shaw, U.S. Department of Agriculture, Washington, D.C. now with Graduate School of Library Service, Rutgers University, New Brunswick, N.J.)


Theoretical Studies

A study of the theories of information search systems. (Y. Bar-Hillel, Hebrew University, Jerusalem, Israel)

Development of a general theory of documentation and the development of searching strategy. (J. W. Perry, Allen Kent, and staff of the Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland, Ohio)

The development of a glossary for machine literature searching. (T. H. Reed, Jr. and Allen Kent, same)

The study of the morphology and development of the semantic code. (Perry, Kent, et al., with John Melton, John Carroll University, Cleveland, Ohio)

The systematization of rules and procedures for the preparation of telegraphic style abstracts. (Center for Documentation and Communication Research, with Jessica Melton, Cleveland, Ohio)

Development of a glossary for ordnance terminology. (Center for Documentation and Communication Research, with Margaret E. Egan.)

The development of a generalized information theory including storage and retrieval theory and communication theory. (Mortimer Taube, Documentation Inc., Washington, D.C.)

A study of methods for indicating relations among index entries, and for copying with interrelations of meaning, in searching systems. (Thyllis M. Williams, Washington, D.C.)

Education and Training of Documentalists

The training of documentalists, a portion of the study of education for librarianship. (J. H. Shera, and faculty of the School of Library Science, Western Reserve University, Cleveland, Ohio, under grant from the Carnegie Corporation of New York.)

Probably no aspect of librarianship is more amenable to research than is the field of documentation. The ends which it purports to serve are particularly receptive to research. The requirements of the user whom the documentalist serves and the ways in which he employs
graphic records are more subject to analysis and scientific generalization based upon observable facts than are, for example, the uses to which the so-called "general reader" puts books from the public library. The pathway by which the former threads his way through the swelling morass of print is, perhaps, less idiosyncratic than that of the casual reader, or even the "serious" user of books. The task of research in documentation is further facilitated by the fact that a majority of its practitioners are trained in the stern discipline of scientific method. Research is not, or certainly should not, be alien to their nature. The documentalist, if he is to be a scientist, should not cringe before the relentless verdict of valid evidence, nor shrink from an unpalatable conclusion.

Yet both the depth and the volume of research in documentation still remain disheartening. There are many areas which are still inadequately explored. Still far too little is known about the use of graphic records by the scholar, and the possible effects upon our society of failure in recorded communication. The basic theory of documentation has suffered from excessive speculation. Systems have been recklessly devised and promoted with an abandon that disregards any evidence of their effectiveness or efficiency. Automation, which has brought such impressive technological advance in many fields, is often decried by documentalists, and, conversely, "machines" have been foisted upon a naïve public with little evaluation of their capabilities and limitations. Classification, as a fundamental tool of documentation, has suffered neglect and often, disparagement. In the face of a seriously acute shortage of trained documentalists and the demand for new skills which are certain to follow in the wake of automation, there has been but slight attention to the professional education of the documentalist. Perhaps worst of all, the entire field is sickled-o’re with the pale case of bias, prejudice, "huckstering," and polemics. Documentation is wallowing in a sea of claims and counter-claims, with no foundation in solid fact.

Further, the documentalist cannot live alone, he must, quite literally, draw his sustenance from many disciplines and a variety of technical developments in a great cluster of related fields. Thus, the contribution that can be made to documentation by information theory, by symbolic logic, by switching theory, by operations research, and by communication theory, to name but a few, must be carefully explored. One may properly assume that each has a contribution to make toward improving the utilization of recorded knowledge, but until a far more extensive program of research, than has yet been undertaken, is carried
through, the nature of the contribution each has to make can be but dimly perceived.

But of all the criticisms that may be brought to bear against research in documentation the most serious is the neglect of fundamentals. As a profession documentation is threatened with a potential exhaustion of its store of fundamental knowledge, and lacking such a reservoir of new theory its literature becomes repetitious, its techniques sterile, and its progress attenuated. There may soon come a time when documentation can no longer advance for the simple reason that it is lost as to the direction which such advance should take, and only a well defined program of fundamental research will restore the sense of direction.

The reasons for this neglect of the fundamental are not difficult to discover. The swelling flood of recorded information has brought outcries of desperation from those who are threatened with inundation. There is an ever-increasing and often irresistible demand for immediate and practicable solutions that promise hope of rescue. Often those who suffer most are least patient with the theoretical, and it is difficult to convince them that the only true solution to their difficulties lies in greater attention to, and support for, fundamental research. As the present writer has previously said:

... only through such fundamental research will those who seek to advance the science of documentation be free to explore wherever or whatever their best judgments dictate. The great fountainheads for the support of research—industry, government, the foundations—must recognize that pure research seldom emanates from immediate practical needs. They must not always ask to see the end foreshadowed in the beginning; they must not always demand immediate and tangible results. They must have courage to invest in the future, fortitude to withstand occasional failure, patience to await results, and faith in the ability of fundamental research to discover the best path. Where there is no vision a profession cannot prosper. A sedulous dedication to the exploration of fundamentals is vital to documentation, and indeed it is this that distinguishes the true profession from the craft.8

Fortunately there is some evidence of an awakening awareness of the importance of research, especially fundamental research, to the future of documentation. Admittedly, mere talk does not solve many problems, but interests and concerns that become vocal have greater opportunity for serious consideration than those which remain unarticulated. The size and character of the audiences that participated in the two recent Cleveland symposia (Conference on the Practical
Research and Developments in Documentation

Utilization of Recorded Knowledge, January 1956. Symposium on Systems for Information Retrieval, April 1957.) eloquently testify to the diversity of interests which have a vital stake in documentation, and where there is general concern the probabilities for constructive action are immeasurably increased. In short, perhaps the most significant feature of these conferences was the simple fact that so many people came to them, people from a great diversity of fields and with a wide variety of needs. It is heartening, too, that so much energy and so many resources are being expended in the promotion of the International Conference on Scientific Information to be held under the auspices of the National Academy of Sciences, the National Research Council, the American Documentation Institute, and the National Science Foundation, and planned for the autumn of 1958. If this conference fulfills its promise it should be a powerful force in promoting research in scientific documentation. In this connection, one should also mention the renewed vitality of the Committee on Research and Development, (under the chairmanship of Saul Herner) of the American Documentation Institute, the expanding program of the Division of Chemical Literature of the American Chemical Society, and the increased interest in documentation evinced by the Special Libraries Association and its newly-formed Documentation Division.

Motivated by the participants at the first Cleveland conference, there was formed in the early autumn of 1956 the Council on Documentation Research which is composed of representatives from over thirty professional, governmental, industrial, and educational organizations which have already recognized the inadequacy of today’s techniques for the storage and retrieval of recorded knowledge. The organization has a four-fold objective:

1. To promote understanding and cooperation among those who produce, organize, and use recorded knowledge of all types and in all fields.
2. To assist in the identification and clarification of problems common to those who produce, organize, and use information in diverse areas.
3. To promote research and development in documentation.
4. To encourage exchange of information concerning developments in principles, systems, and equipment for the effective organization of graphic records.4

If the American Documentation Institute expands its concern with research, one may anticipate a consolidation of the Council with it,
but at the present time the two organizations appear to meet somewhat different needs.

Without financial support research in any field can make little progress, however enthusiastically it may be championed, and to this documentation is no exception. Harassed by the growing problem of the need to use efficiently the essential body of recorded information, industry and business are increasingly making funds available for the improvement of palliative measures. At the present time unfortunately little of this is available for fundamental research, but it may prepare the way for more theoretical exploration. The growing awareness on the part of enlightened management of the importance of the documentation problem gives reality to the prognostication of a time when a vice president in charge of information may be an essential officer in every major commercial and industrial enterprise.

Government, especially the federal government and its agencies concerned with the armed forces and intelligence generally, is, perhaps, even more alert to the importance of documentation than industry and trade. It is increasingly making substantial amounts of money available for documentation research, with considerable regard to the need for the support of fundamental research as well as for development.

Most important of all, however, are those agencies created for the specific purpose of disbursing funds for the support of activities dedicated to improving man's knowledge. The many benefactions of the Carnegie and Rockefeller Foundations are well known to librarians, and there is now some evidence that they may be turning their attention to the more specialized field of documentation. More directly concerned and more immediately active, however, is the Division of Scientific Information, under the leadership of Alberto Thompson, of the National Science Foundation, which is supporting a number of projects in documentation applied to the science fields, and which, in May, 1956, sponsored a conference at Endicott House in Cambridge, Massachusetts, at which were brought together some thirty representatives of a wide variety of scientific disciplines in the hope of formulating a program of research in documentation that would enlist the contributions of such fields as electronic engineering, information theory, linguistics, and others. Exploratory discussions of this kind are of great value if they are to be supplemented by a program of activities that will carry forward their recommendations.

Perhaps, most important of all, however, was the creation about a year ago, of the Council on Library Resources, Inc., supported by a
Research and Developments in Documentation

five-year grant from the Ford Foundation, and under the directorship of V. W. Clapp. At the time this is being written the initial grants of the Council have not yet been announced, but one of its stated objectives is "through grants-in-aid to institutions and individuals, to identify the problems which now present obstacles to efficient library service, and seek to find methods for overcoming these impediments through the development of new procedures and the application of technological developments."

The responsibility of the documentalist to perfect his techniques and methods may be far more urgent than even he himself realizes. In Eastern Europe a great giant has, at long last, shaken off the shackles of feudalism and put scientific and technical knowledge to work with all the power of dictatorship. Today the English-speaking peoples of the earth face a new threat of world economic conquest and the domination of men's minds. Much has been heard of late concerning the growing superiority of Soviet science, and the extent to which it may be outproducing ours, not only in the manufacture of instruments of war, but also in the development of peaceful applications of scientific research. The American press has issued alarming reports of Russian pre-eminence in the training of scientists and engineers, and the alleged success of Soviet planning in its relentless drive toward world leadership.

At least partially in substantiation of these claims there have recently appeared three publications prepared by members of the Academy of Science of the U.S.S.R., and issued in Moscow. These indicate that Soviet documentalists have, by the application of documentation theory originally developed in the United States, devised experimental equipment for mechanized literature searching. Admittedly this equipment is still a prototype, or was when these publications were issued, and so far as is known here it lacks many of the capabilities which American documentalists believe to be possible for mechanisms of this sort. But it is well to be reminded that no secret is being made of this achievement, and one can leave to his own conjecture the amount of such Soviet progress that has not as yet been publicly reported.

On our ability to prosecute fruitful research and development in documentation may rest the very future of our civilization and the perpetuation of our cherished way of life. We are today engaged in a grim game; we may not long hold all the high cards, if indeed we do now. Research in documentation is more than an intellectual game pursued for the love of the sport and the intellectual excitement that
it may engender. The documentalist of today bears a burden of responsibility far heavier than any known to his predecessors; he may even hold the key to the future of mankind.

References


