MASTER

CURRENT REFERENCE MATERIALS
FOR THE PHYSICAL SCIENCES

Raphaella Kingsbury

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CURRENT REFERENCE MATERIALS FOR THE PHYSICAL SCIENCES*

by Raphaella Kingsbury
Head Reference Librarian, Technical Library
Lawrence Berkeley Laboratory, Berkeley, Calif.

To pursue current developments in reference materials for physical science, it is essential first to chart the course to decide where we start and where we are going. What are the Physical Sciences and what guides are needed for the Physical Scientists? According to a survey made by the National Science Foundation a few years ago, the fields of science numbered 620. However, the scientific territory has always been divided into four major domains: Mathematics (for relationships of numbers, shapes and logic symbols); Physical Sciences (for study of inanimate constituents of the universe); Biological Sciences (for study of living matter); and Social Sciences (for the study of human conduct and relationships). But each of these provinces is constantly being divided and subdivided into smaller communities for specialized research; and streams of thought and discovery flow from one area to another. There are no boundaries nor restrictions; and, while each small area autonomously engages in independent exploration, it gives and receives support in other regions. Therefore, we cannot speak of any large scientific area without considering the whole cooperative universe of science.

In our age we are aware of a tremendous expansion of science; but scientific observations have been made since the dawn of civilization, and the Greeks are still contributing their "words for it", as well as their Greek letters. The fact is that we feel the pressure of progress because of increased publication and speed of communication and travel. And this is our problem: to provide guides for the published literature, data sources, personal contacts, language problems, and meeting of minds.

Where does the Reference Librarian or Information Specialist stand in this vast realm of science? Surely not as an authority nor subject

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*This article is based on the paper presented at the Educational Seminar of the SLA Conference in San Francisco, June 1971, as well as at the Lecture Series on Current Developments in Library Reference Tools, sponsored by the SLA San Francisco Bay Area Chapter Jan/Feb. 1971. Annotated bibliographies were distributed to participants at the time, and the bibliography for this paper, issued by the Lawrence Berkeley Laboratory as UCRL-20256 Part II may be obtained upon request from the author.

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specialist! That is the prerogative of the researchers who in graduate studies toward the PhD learn everything there is to know about some small aspect of the whole. The scholar, in other words, knows a great deal about a very little. We as Reference Librarians know a very little about a great deal, and upon this we build our professional service.

We operate an answering service, interpreting references, identifying citations, locating facts, figures, and people, and indirectly teaching the use of bibliographic tools. As a pleasant side-line at the Lawrence Berkeley Laboratory, I respond to letters from students and teachers in regard to our research. I am an "answer ma'am", dubbed by a colleague as "Dear Libby". One letter arrived some years ago addressed to the Accelerator Department, care of the 184-inch Librarian. The sender received a pamphlet on the 184-inch accelerator. This correspondence is our public relations service to the laymen. If any librarians in the audience need to have material for similar services to the non-scientists, they may obtain excellent information pamphlets on all levels from the Educational Services of the Atomic Energy Commission.*

As practicing librarians in the scientific community, you will want to know the practical reference material that will furnish answers to your library users. In bringing to your attention recent titles, I prefer to discuss broad categories and fit the titles into these, with emphasis on applications.

GUIDES TO SOURCES AND LITERATURE

Although this seminar is essentially a guide to sources and literature in selected fields, it is fortunate that published guides are available to supplement the brief presentations.

The International Compendium on Numerical Projects¹ is a most valuable guide produced by CODATA (Committee on Data for Science and Technology) established in 1966 by the International Council of Scientific Unions to make a world-wide survey and coordinate the findings. This is the result. The centers are arranged by country of origin and then by subject area of the data. For each data center are given: a complete

*Educational Services, USAEC Division of Technical Information Extension
P.O. Box 62
Oak Ridge, TN 37830

history of the project, the coverage, and availability of the data. National Data Programs of several countries are described, as well as centers covering a number of areas and even secondary centers. Also listed are Handbooks and other sources of tabular data. Good indexes provide access points to all information. With such a guide available, science librarians can well equip both their libraries and patrons with books and answers. This compendium will be updated within the next few years but is valuable in the present edition.

The Handlist of Basic Reference Material for Librarians and Information Officers in Electrical and Electronic Engineering², compiled by E.M. Codlin and R.S. Lawrie, is one of the best bibliographies of the basic needs of an electronics library and, incidentally, a good example of what a bibliography should include. It was issued by the ASLIB Electronics Group.

Literature of Chemical Technology³, issued by the American Chemical Society, is an excellent guide in chemistry. Originally based on papers presented at two ACS Division of Chemical Literature symposia in 1963, this book contains all papers updated to include references through 1967, as well as additional papers. The work is authoritative, each chapter being contributed by a specialist, and the total coverage being exhaustive for industrial chemistry. For example, some of the subjects covered in the 40 chapters are: refractories, industrial gases, ceramics and glass, pharmaceutical and medicinal chemistry, cosmetics. All bibliographies are extensive, including many types of material.

DIRECTORIES

Directories also serve as Guides by directing the librarian to special sources of information. For example, many questions of scientists, teachers and researchers can best be answered by specialized information and data centers which can be located through a Directory. The most recent publication is called an encyclopedia because of its comprehensive scope but falls into the category of Directories.

Encyclopedia of Information Systems and Services⁴, compiled by

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A.T. Kruzas and others, published in 1971, is a directory of information systems and services in the United States and Canada. The basic part of the book lists and describes 833 organizations that maintain and provide such services; and 12 indexes and a dictionary section provide access to the contents. This is an excellent addition to your directory section, but other directories can also serve a purpose by standing on your shelves. There are bound to be overlapping and duplication in such listings, but one cannot always be sure "whence cometh help".

Directory of Federally Supported Information Analysis Centers⁵, issued by the Federal Council for Science and Technology, is an alphabetical listing of selected data centers with full information as to address, telephone number, director, sponsor, mission, scope and services provided. Indexes by operation centers, geographic location, organization and subject, add to the usefulness.

Directory of the Defense Documentation Center. Referral Data Bank⁶, a computer-produced publication, lists government-supported agencies with indexes by activity, contact and subject.

To locate and identify research organizations in other countries, one usually starts with the World of Learning, as an old basic reference aid, and, for the nuclear sciences, the World Nuclear Directory, now in a 3d edition (1966). But these have their limitations and we must often look elsewhere.

European Research Index⁷ in 2 volumes proves to be a much needed directory. The arrangement is alphabetical by country with an alphabetical listing of research centers and universities under each country. Each entry includes the name in the original language with translation, address, and directors of each research department. At the end of volume 2 are indexes by original title, English name, subject and keywords. USSR is not included but other iron curtains are drawn.

International Physics and Astronomy Directory⁸ and International Chemistry Directory⁹, produced by the W.A. Benjamin Company, are inval-

uable contributions in this category. A handy sized, readable book, each directory is international in scope, including faculties of accredited universities; government research laboratories; societies; awards; publications; etc. For each institution are given: address, telephone number, members of the faculty and even the name of the librarian. For each faculty member are given the birthdate, highest degree received with date, field of research and interest. The indexes include an alphabetical listing by names of faculty members and a geographical index.

Directories of individuals, of course, are membership lists of societies, such as the American Physical Society Bulletin issue each year devoted to membership. These lists give names and current addresses; but the Reference Librarian knows that the current affiliation of a scientist is best found through a published article, and it is, therefore, necessary to use journal indexes to locate the article which will yield the needed information and often a biographical sketch of the author as a bonus.

HANDBOOKS

There are useful handbooks on every subject, and in the physical sciences the Chemical Rubber Company has stretched itself to the utmost, its most useful and famous publication being the Handbook of Physics and Chemistry, without which no science library has functioned. In this brief discussion I wish to mention only those handbooks that pertain to safety, since that has always been of importance to research and industry even before the public became aware of the environment in which it existed.

Handbook of Radioactive Nuclides¹⁰ presents authentic information on nuclear data, essential physics data, nuclear instrumentation, radiation dosimetry, biochemistry, radionuclides for both medical and industrial applications, radiation protection and regulations, and control of radiation injury.

Handbook of Laboratory Safety¹¹ is intended to provide convenient information for hazard recognition and control. The contents include

material on safety management and protective equipment, ventilation, fire hazards, chemical reactions, and a section each on toxic, radiation, electrical, mechanical and biological hazards.

Sax, Irving. Dangerous Properties of Industrial Materials¹² is not a CRC publication as the previously mentioned, but is also a quick, concise, up-to-date source of hazard analysis information. The latest edition includes a section on control of environmental pollution. The section on general chemicals is an alphabetical listing of chemicals with description, formula and hazard analysis of toxicity, cautions and countermeasures for each.

As a late press release, may I also mention that the American Institute of Physics Handbook will appear in a third edition at the end of 1971, published by McGraw-Hill at \$35.00. The second edition was issued in 1963, and the up-dated revision will be welcomed.

INDEXES AND ABSTRACTS

Indexes are essentially the key to published literature, and of special significance in the field of science because of the diversity of form in which the material is issued. Contrary to public opinion, conditioned by early exposure to the Readers Guide to Periodical Literature, these indexes cover all published material, not just journals. I have met resistance from graduate students and even scientists to the use of these indexes because of the misconception; but, after a demonstration in uncovering an obscure reference, I have made them index-converts.

Before discussing the great standby, Chemical Abstracts, and its recent contribution to the scientific and library world, I wish to mention a few others that have existed for years but have become increasingly useful.

Science Abstracts, published since 1898 primarily for journal articles, has now a split personality, functioning with three faces: Series A, Physics Abstracts; Series B, Electrical and Electronic Abstracts; and

with 1966, Series C, Computer and Control Abstracts¹³. These indexes now include bibliographies, books, conference proceedings, theses, research reports, and patents, as well as journal articles.

Nuclear Science Abstracts¹⁴, a war baby, has grown into the most comprehensive reference tool for all aspects of nuclear science. Here again one has to overcome the idea that only so-called documents or research reports are indexed in this. The abstract service covers all published literature throughout the world, and the 5-year cumulative indexes by author, issuing agency, and subject are invaluable. The cumulative report number index makes it possible not only to locate the original abstract but also to determine the availability or publication of the reports. I mention this older index (if one can call a war baby old) because of a new service since 1966 in the form of NSA tapes which facilitate the retrieval of items, even in advance of publication of current NSA issues.

In 1961 a most unique index came into focus, Science Citation Index¹⁵, a computer-produced, inter-disciplinary index to journal literature with the citation as the point of departure. Incidentally, this index is primarily for journal articles, but the method is unusual in science. Citation indexing in itself is not a new idea; Sherard's Citations has been a legal reference tool since 1873, and the legal profession uses the citations to establish precedents. But the citation approach in science is used to find related material, the assumption being that any author who cites another author is writing about the same or related subject. Any inquiry from the publisher will bring complete information in a brochure or even a representative of the firm.

And now we turn to Chemical Abstracts without which no science library could function. In addition to the tremendous improvement of service, there is this recent contribution which is invaluable in any type of library:

Chemical Abstracts Service Source Index (CASSI)¹⁶, formerly called

ACCESS when it first appeared in 1969 as a cumulated hard-bound volume to replace the previous lists of periodicals abstracted in Chemical Abstracts, provides not only a complete listing of all material indexed in CA but also serves as a Union List of periodicals, conferences and books. In other words, the user can not only identify a citation but also determine under what title the material will be listed in a library and also locate a library where the journal or book is held. To identify serials, CASSI is easier to use than the Union List of Serials and New Serial Titles, because the titles are listed exactly as the citation reads and then "translated" into the standard library entry.

As a postscript to this section on Indexes, I wish to mention briefly the various services provided through computer applications. These may often seem costly but save time, energy and actually the cost of manual searching. As a guide to such services, this work of an SLA member is valuable:

Carroll, Kenneth. Survey of Scientific-Technical Tape Services.¹⁷

SCIENTIFIC CONFERENCES

Since science information is exchanged at national and international meetings and the prestige of scientists established with papers presented, the scientific public is interested in two aspects: (1) when and where is a conference to be held, and (2) have the proceedings been published. In section H of the bibliography (UCRL-20256) this is discussed in some detail, but I will mention a few titles.

For meetings to be held in the scientific, medical and technical fields the best references are: World Meetings: United States and Canada¹⁸ and World Meetings Outside United States and Canada¹⁹. Each issue is a two-year registry of conferences, arranged in quarterly groupings, and for each entry complete information is given as to name of meeting, place, date, sponsor, deadlines for papers, contact for general information, and even anticipated publication of proceedings. There are indexes by date of meeting, keyword, deadline, location, and

sponsor. Of particular interest to metallurgical and chemical specialists is the World Calendar of Forthcoming Meetings: Metallurgical and Related Fields²⁰ which is a completely chronological listing of conferences with full information and indexes to subjects, sponsors and locations. This is sometimes a quicker reference than the others but for the limited areas.

For published proceedings the two outstanding references are: Proceedings in Print²¹ and the Directory of Published Proceedings²², referred to as InterDok. Both publications cover extensive territory both in subject and location, and, although there is overlapping, both are useful. Proceedings in Print is arranged by accession numbers with a single alphabetical index that includes corporate authors, sponsoring agencies, editors and keywords. The information is accurate, but there is no geographic approach. InterDok has a chronological arrangement which makes quick checking possible; and, in addition to the main index which includes keywords, conference names and sponsors, there are separate indexes by editor and location. The last index is particularly helpful. With InterDok the individual issues are superseded by annual cumulations; whereas with Proceedings in Print the index portion is cumulated annually.

International Atomic Energy Agency, Meetings on Atomic Energy²³ and the Index to Conferences Relating to Nuclear Science,²⁴ issued by the AEC, are not limited to the nuclear field unless one understands nuclear science in its broadest sense. These indexes have many unusual features. The IAEA publication includes announcements of meetings, seminars, courses and conferences as well as listing published proceedings. The USAEC publication also includes both unpublished and published proceedings, being in effect an index to entries in the Nuclear Science Abstracts. Meetings can be identified through permuted indexes by keywords, subjects, cities, and report numbers.

TRANSLATIONS

Since our American Scientist is not a multi-lingual creature, it

is necessary for the Librarian to know about translated material in the hope of producing instant translations for the requester without subjecting his organization to the expense of translations-made-to-order.

The Guide to Scientific and Technical Journals in Translation²⁵ by two SLA members, Carl J. Himmelsbach and Grace E. Boyd, is an excellent compilation of cover-to-cover translations of journals. This is a first check point for an existing translation.

The Consolidated Index of Translations into English²⁶ is a compilation, purely by source, of all translations made through 1966. Despite many weaknesses and omissions, unavoidable in such a tremendous undertaking, this single volume is a convenient key to translations of journal articles and patents that may be ordered from translation centers. Although an SLA publication, this volume is supplemented by a current serial issued by the National Translations Center which is no longer a part of SLA but of the John Crerar Library. This essential serial is known as Translations Register-Index²⁷ and is also an index by sources of currently available translations.

Government-sponsored translations are listed by author, subject and translation report number in such indexes as Nuclear Science Abstracts, NASA Scientific and Technical Aerospace Reports, and Government Reports Index. Translated books, of course, are included in the National Union Catalog and in publishers' announcements.

CONCLUSION

There is never a last word in the library world, especially in reference work. The true value of a seminar or conference is in the personal contacts that extend our own horizons; and true inter-library cooperation is realized not just by inter-library loan but also in inter-librarian service.

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Consolidated Index of Translations into English. New York:
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quarterly, semiannual and annual indexes) \$50.00 per year.

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LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA 94720