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On-the-Job Training of Library Personnel

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TECHNICAL MEMORANDUM

(TM Series)

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On-the-Job Training of Library Personnel

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Second Interim Report
October 31, 1968

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SDC

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SUMMARY

This second interim report describes progress on a project to prepare and evaluate experimental instructional materials for use in on-the-job training in scientific and technical libraries. This project is being conducted by System Development Corporation under contract to the U.S. Office of Education and with the support of the U.S. Army. Work was begun on the project on June 28, 1967 and will end on March 31, 1969. This report briefly reviews work completed in previous reporting periods and reports on progress between May 31, 1968 and October 31, 1968.

Three instructional packages are being developed. One, in the area of technology in libraries, consists of a sequence of instruction devoted to system analysis and is directed toward professional librarians. The other two sequences, Reference Tools and Services and Russian Transliteration, are intended for nonprofessional library personnel. In the period since May 31, development of the system analysis package was continued. The total number of instructional units in this package was increased from 5 to 7 or 8, half or more of which are to be slide and sound presentations and the rest paper materials. Final technical modifications to both portions of the package will be completed in November.

The reference tools and services package is now planned to contain 12 instructional units. Nine of these units are being subjected to final modifications and packaging prior to field testing which will be completed by December 6. The Russian Transliteration package, consisting of 6 units of instruction, has been completed and will be tested in mid-November.

During November and December final modifications will be made to the instruction and the units packaged for field testing. The field tests have been designed to evaluate training effects and attitudinal responses. Test design is somewhat different for each of the 3 packages and is described in detail in this report. The remainder of the contract period will be devoted to test analysis, final revision of instructional materials and preparation of a final report.

1.0 INTRODUCTION

This project is conducting research and development to construct, pilot-test, modify, field-test, and evaluate experimental instructional materials responsive to training requirements for personnel in scientific and technical libraries. The objectives of the instruction include improvement in the knowledge and skill of library personnel at both professional and nonprofessional levels and consideration of the relative efficacy of different media and techniques of imparting such instruction. The initial efforts of the project relate to the training requirements of scientific and technical libraries and involve three instructional sequences. The first sequence deals with the role of technology in libraries. It concentrates on system analysis and is directed toward professional librarians. The other two sequences, which are intended for nonprofessional library personnel, present instructional in reference tools and services and Russian transliteration.

This second interim report is the third of four project reports. The two reports that have already been submitted are TM-3762/000/01, "Planning for On-the-job Training of Library Personnel," which summarized the efforts made through the period July-December 1967 and outlined proposed areas of work for the project period and for later developments, and TM-3962/000/00, "On-the-Job Training of Library Personnel," which was the first interim report, covering the period January-May 31, 1968. A final report will be submitted on March 31, 1969.

This current report presents a summary of the work to date, including a review of past progress, a description of the instruction packages developed to date, and an experimental design for field testing of the developed instructional materials. The Appendix contains examples of the developmental materials for serials reference work.

2.0 REVIEW OF PROGRESS

2.1 REVIEW OF PREVIOUS REPORTING PERIODS

Between June and December, 1967, work on the project was devoted to reviewing educational and training literature, exploring in-service training needs in libraries of several kinds, and in building a planning document for concurrence by USOE and the U.S. Army. Between February and the end of May, 1968, the principal effort was devoted to job and task requirements analysis for the areas of reference work, foreign and technical terminology, and technology in libraries to which the initial efforts for building instruction were to be directed. As the design effort proceeded it was decided that the technology and library package would consist in this contract period of a sequence of instruction devoted to system analysis and that the principal concentration of the other two packages would be on reference tools and Russian transliteration. During this period of time, contacts and interchange of views were sought with many librarians, and much useful advice and perspectives were gained in aiding the design effort.

The principal activity during the previous reporting period was that of developing formal statements and objectives for on-the-job training, and to arrive at decisions concerning the design of instructional units within the three areas of concentration. Each unit was designed to require approximately 30-40 minutes for completion by a trainee, with the expectation that some trainees would complete the units more quickly and others might take as much as 50 or 60 minutes. A final report during the period was development of specific design and production requirements including, in some detail, an outline of the content to be covered in each unit and the media to be used for presenting it.

2.2 REVIEW OF CURRENT REPORTING PERIOD

2.2.1 Instructional-Package Production

From May 31, 1968 through October 31, 1968, the design and development of each of the three packages were continued and unit construction was pursued. In addition, an effort was

devoted to completing an experimental design for field-testing the completed units, and an iterative process of preliminary testing, subsequent modification, and retesting of instructional materials was continued.

System Analysis Package

As work on the System Analysis package proceeded, it became clear that the original projections of the number of units to be constructed needed to be revised. It was decided to increase the number of units from 5 to 7 or 8, half or more of which are to be sight-and-sound presentations and the rest paper materials.

As of this writing, final modifications have been made to the scripts which are used with slide and sound units of the system analysis package and re-recording and other technical production tasks are underway. Production will be completed in November for units to be field tested. The paper units of the system analysis package are in final draft form and, having been tested, will be subject to a final modification and production cycle during the same period as the previous units. A final unit is expected to be produced which will be sound and paper only addresses the problems of communication between librarian and systems personnel. This final unit will not be a part of the field testing per se.

Reference Tools and Services Package

It became clear in preliminary testing that more units than the 6 to 8 that had been anticipated would be required for the reference tools area. It is now planned that this package will contain 12 units. These early trials also led to a decision to confine the instructional media to paper presentations because there did not appear to be any advantage to other media over paper for this area of instruction.

The package is divided into one unit entitled "Introduction to Reference Works," two units on bibliographic tools and catalogs which cover Ulrich's International Periodicals Directory and the Union List of Serials in the United States and Canada. Two units devoted to encyclopedias and handbooks concentrate on McGraw-Hill's Encyclopedia of Science and Technology, the Standard Handbook for Mechanical Engineers and the Handbook of the

Engineering Sciences. Three units have been completed on directories with the instruction devoted to Thomas Register of Manufacturers, the Research Centers Directory, and American Men of Science. Three units have been completed on serials indexing and abstracting sources consisting of an introductory unit, a second devoted to Engineering Index and a third to Physics Abstracts. The final set of instruction on reports indexes consists of one unit directed to U.S. Government Research and Development Reports. Nine of these units are being subjected to final modifications and packaging for presentation in the field. Three are in the process of preliminary testing, with final packaging for field testing planned for completion on or before December 6.

Russian Transliteration Package

The Russian transliteration package has been completed and will be tested in mid-November. It consists of six units of instruction that require three to six hours for typical library personnel to complete.

Because of the increase in the number of units required for the initial areas of instruction, it has been decided not to try to produce the sequence directed to user interaction in this contract period, and to confine the instruction in technical terminology to one unit on system jargon that will be intended to reinforce the system analysis instruction.

2.2.2 Field-Test Design

The field tests have been designed to evaluate both training effects and attitudinal responses. The test design is somewhat different for each of the three packages.

Systems Analysis Package

The test samples for the system analysis package will be composed of experienced professional librarians who presently work in a library but who have no experience with system analysis. Library experience includes a library school education and/or

on-the-job experien . The experimental groups will consist of a training group and a control group, each consisting of 15 subjects. Intelligence and interest testing will not be done with these subjects since they will have already been naturally "selected" by their job categories. In this way, it is hoped to avoid arousing unnecessary resistance to the experiment. Biographical data, including education, amount of experience and specialization will be gathered and used to help match the experimental and control groups.

The experimental sequence for both groups will consist of:
(a) a preliminary test of knowledge of system analysis,
(b) a training sequence (experimental or control), and
(c) post-testing of knowledge, performance and attitudes.
The experimental group will be given the units of the package. The control group will read articles and books on system analysis during scheduled periods of time equivalent to those used by the experimental group. Every effort will be made to encourage all subjects to use the same amount of calendar time to work through the units.

Test materials will consist of a preliminary knowledge test and a post-testing package. The former will contain multiple-choice concept and factual items geared to sample the main content points of the training package.

The post-testing package will contain four kinds of items. These are:

(a) Content acquisition items asking the trainee to reproduce conceptual knowledge provided by the training materials.

(b) Problem-solving items requiring the trainee to generalize the procedural knowledge acquired in the training sequences and to solve problems of system analysis that are presented in terms and concepts which differ from those of the training package.

(c) Advanced reading readiness items which require the trainee to reproduce advanced conceptual knowledge contained in advanced articles on system analysis which he reads as a part of the test. The advanced articles contain concepts not covered in the training package materials.

(d) Attitude items that assess the trainees' attitudinal reactions to the training.

Pretest and post-test scores will be examined in an analysis of covariance. Interactions between pre-existing knowledge and post-test performance will thus be considered and the primary effects of the experimental and control treatments on the post-test results will be efficiently compared.

Reference Tools and Services Package

Subjects for the reference tools training package will be selected from two different populations. One population will be college undergraduates recruited from the Los Angeles area. Selection will be limited to women students who have not taken library school courses. The other population will consist of nonprofessional workers in libraries in the Los Angeles area.

Four experimental groups will be created: a training (experimental) and a control group for the student population, and a training and a control group for the library clerical worker population. A minimum of ten subjects will be obtained for each group. Pretesting for intelligence, interests and relevant knowledge will be done with the student population but not with the library clerical staff population, again to avoid arousing unnecessary resistance to the experiment.

The experimental treatment consists of administering the units of the reference work package to the subjects. Control treatment consists of directing subjects to reference works studied and/or mentioned in the training package and have them spend equivalent amounts of time in undirected study of these works.

Pretesting of the student population will require two hours. The intelligence test will be the Wonderlic Personnel Test, the interest test will be Strong's Women's Inventory (Librarian Scale) and the relevant-knowledge test will be a truncated version of the Library Orientation Test published by Teacher's College Press.

Post-testing will use two kinds of tests. One will be a content test which asks the subjects to reproduce information and knowledge provided in the reference work package. The other test will consist of one or two references and will provide standard time and instructions simply to "try to learn how to use them." In this way, the subject's ability to rapidly learn how to use reference tools on his own will be tested. Analysis will consist of using the pretest and post-test scores in an analysis of covariance and will compare the experimental and control treatment results by main effects.

Russian Transliteration Package

The language package consists of two alternative ways of teaching transliteration of the Russian alphabet. One emphasizes memorization followed by drill. The other involves table look-up in combination with a simple version of programmed instruction. Subjects will be selected from two populations: college undergraduates selected in the same manner as for the reference work package and clerical workers in libraries. None having any experience with reading or speaking Russian will be selected.

The experimental groups will consist of one training group using each learning method. No control group is necessary. Each group will total ten or more subjects, mixed between the student and clerical populations. The training sequence will consist of applying one or the other training treatments for equal periods of time, followed by post-testing.

Pretesting for intelligence will consist of a short, language-learning aptitude test. The scores will be used to equate the two experimental groups. Post-testing will consist of a timed performance test, and pretest and post-test scores will be examined in an analysis of covariance.

3.0 PLANS FOR NEXT REPORTING PERIOD

3.1 FIELD TESTING

During November, 1968, instructional materials will be finally modified and packages for field testing. With the cooperation of the librarian and the placement office, students from Santa Monica City College are being screened for participation in the field test of the reference package and the transliteration package. These students consitute a test population comparable to that of nonprofessional personnel in libraries.

The rationale for selecting a junior college population for subjects to test the instruction is that we are able to obtain a more easily controlled subject population that can be divided into relatively well-matched groups and whose experience is minimal with respect to the materials involved in the instruction. One would expect a larger variation in performance from the library workers that will be tested later, due to broader differences in their experience and knowledge.

During December, other selected libraries will be used for testing the instruction. These include the National Agricultural Library, the University of California, at Los Angeles Libraries, and the Los Angeles Public Library as representative large libraries. It is expected that smaller libraries will include Edgewood Arsenal Technical Library, the Picatinny Arsenal Technical Information Branch, and three quite small libraries: the Bunker-Ramo Corporation Library in Canoga Park, California, the University of California at San Diego Engineering Library, and the Marine Technical Information Center of the California Department of Fish and Game. Testing will be conducted through February, 1969.

3.2 COMPLETION OF STUDY

The latter part of February and all of March will be devoted to analyzing the test results, making final modifications to the instructional materials, writing the final report, and preparing for the turnover of instructional packages to USOE.

APPENDIX

The following pages present examples of instruction from the Reference Tools and Services package covering work with serials reference tools.

BIBLIOGRAPHIC TOOLS - SERIALS UNIT 1

INTRODUCTION

There is perhaps no library resource more vitally important to scientific and technical workers than the literature published in serials, journals and other publications that are issued in a series of successive issues or numbers. You have probably already seen and handled many of the journals that are issued weekly, monthly, quarterly, or even less frequently, by professional societies. Some of these have appeared continuously over a long period of time. For example, the American Physical Society has published Physical Review since 1893; in England the Royal Society of London has published various journals since 1665. Other familiar examples are the American Mathematical Society Bulletin (since 1894) and the Annals of the New York Academy of Sciences (since 1877).

Serials such as these are often called periodicals because they appear at regular periods, or intervals, of time. Newspapers and popular magazines are also in this category, but usually they are not important sources of information for scientific, technical, or industrial work. Some serial publications do not appear at regular intervals--reports such as those on pesticides or soil conditioning that are issued, from time to time, by an agricultural extension service or the series of mathematical tables produced and published by the U.S. Bureau of Standards and known as the "Applied Mathematics Series" are examples of this type of serial publication. In any case, for the purpose of this unit, it is not important to distinguish between periodicals and other serial forms.

No single technical library, no matter how large, can expect to meet the demand for various journals and technical reports with the supply of serials on its own shelves alone. There are far too many journals, and other forms of technical literature, being published today throughout the world for any library to be able to stock all of them, and there are more scientists and other technical researchers working today than ever lived up to 1900. Therefore, both the production of technical information, and the demand for it, are now at unprecedentedly high levels. In this unit of instruction (and the next one) you will learn how to use three reference books to answer questions that arise when you need to go outside your own library to fill a request for a serial. The three are:

- Ulrich's International Periodicals Directory
- Union List of Serials
- New Serial Titles

In these useful books you can often (but not always) find the answers to such questions as:

- Is there a library in the U.S. or Canada that is able to supply a copy of a requested journal that is not available in your library?

- What is the price and publisher of a journal that your library wishes to add to its collection?

- Do you have the correct title for a journal you want to borrow from a remote library?

. Where is the journal Science indexed?

These tools are a small sample of the published reference works that are designed to answer questions about the cost, identification, existence, and sources of serial publications. Although 30 or 40 minutes of instruction in Units 1 and 2 will not make you an expert in using them, you will be well on your way to becoming a skilled user of them. Most important, you will also learn how to continue to increase your knowledge and improve your skill.

You have a vital job in the library. When you perform it well you may make a contribution to a piece of research, or to the development of a new apparatus, in much the same way as the scientist or engineer himself. The knowledge is put on printed pages so that readers can use it but the readers must first have access to the pages. The history of science and technology has revealed many instances of wasteful duplication of work. In the 1920's, for example, a Russian mathematician named Tchuprow published an important paper on the theory of statistical sampling in a European journal called Metron. (Many of his ideas are used today in computerized forecasts of election results.) Some 15 years later, in the Journal of the American Statistical Association, a distinguished University of California professor published a paper describing the same sampling concepts that Tchuprow had reported in Metron. This professor, and his many American readers, remained unaware of Tchuprow's earlier work until the late 1940's, when a student came upon it quite by accident while browsing through Metron in the stacks of a midwestern university.

History reveals other cases in which important scientific information was published but did not come to the attention of researchers

until long after its publication. In 1866, an Augustinian monk named Gregor Mendel published a paper that (ultimately) opened the way to the modern study of genetics. More than 30 years went by before Mendel's paper on the patterns of biological inheritance (these patterns are now called Mendelian Laws) came to the attention of European scientists--30 years during which great progress could have been made, if Mendel's work had been known.

To be sure, there are many reasons for such tragic waste of human knowledge, and many of them have little to do with how well you do your job. But the better you are at your job, the less likely it will be that the researchers your library serves will fail to have access to the published information they require in their work.

Let's see how much you may already know about the serials area. The quiz that follows will take about five minutes of your time. If you can't answer any question readily, skip it--you will know the answers to all of these questions, and more, by the time you finish these two units. Turn the page, and GOOD LUCK.

QUIZ

(You need only supply the letter that designates your answer; for some questions more than one letter is required to designate a correct answer.)

1. Ulrich's International Periodicals Directory lists publications of the _____.
   (A) United States only
   (B) United States and Canada
   (C) whole world

2. New Serial Titles lists periodicals which began publication after _____.
   (A) 1940
   (B) 1950
   (C) 1960

3. The entries in Ulrich's International Periodicals Directory are arranged _____.
   (A) alphabetically by title
   (B) by subject classification
   (C) by date of publication

4. Union List of Serials bibliographical entries include _____ and _____.
   (A) beginning date of publication
   (B) cost
   (C) place of publication

5. The frequency of publication for a serial can be found in _____.
   (A) New Serial Titles
   (B) Ulrich's International Periodicals Directory
   (C) Union List of Serials

6. You can find out where a periodical is abstracted or indexed by looking in _____.
   (A) New Serial Titles
   (B) Ulrich's International Periodicals Directory
   (C) Union List of Serials

7. Union List of Serials and New Serial Titles list libraries in the _____ that receive various serials.
   (A) United States
   (B) United States and Canada
   (C) whole world

8. New Serial Titles is kept up to date by _____ and _____ issues.
   (A) monthly
   (B) quarterly
   (C) semi-annual

9. Ulrich's International Periodicals Directory is published in two volumes. Volume 1 is entitled _____; Volume 2 is entitled _____.
   (A) Scientific Serials
   (B) Basic Reference Sources
   (C) Scientific, Technical and Medical Periodicals
   (D) Arts, Humanities, Business and Social Sciences
   (E) Standard Periodicals Directory

10. You need to know the cost of an annual subscription to ISIS, a quarterly devoted to the history of science. You would begin your search for this information in _____.
    (A) New Serial Titles
    (B) Union List of Serials
    (C) Ulrich's International Periodicals Directory
    (D) N.W. Ayer and Son's Dictionary of Newspapers and Periodicals

11. The following entry appears on p. 3 of New Serial Titles, 1964, vol. 1:

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°ACS BULLETIN. (AMERICAN CANCER SOCIETY)
NEW YORK. 1, OC8, 1951-
CaBVaU 1-

    (A) When (month, day, and year) did publication of the ACS Bulletin begin? _____.
    (B) What do the symbols, "CaBVaU 1-", at the end of the entry cited above, signify? _____
    _____

12. Since 1959 the International Statistical Institute has been responsible for an abstracting service covering journal articles and books that deal with statistical methods and theory. It performs this service with regular publication of Statistical Theory and Method Abstracts. Where would you look to confirm the title of this publication?
    (A) Ulrich's International Periodicals Directory
    (B) N.W. Ayer and Son's Directory of Newspapers and Periodicals
    (C) New Serial Titles
    (D) Union List of Serials

13. Suppose you wanted information about the cost of subscribing to the service described above (in 12). Where would you look? _____

(A) Ulrich's International Periodicals Directory
(B) N.W. Ayer and Son's Directory of Newspapers and Periodicals
(C) New Serial Titles
(D) Union List of Serials

14. Which of the following would you assume is not listed in New Serial Titles or Union List of Serials? _____

(A) Directory of British Scientists
(B) The New York Times (the newspaper)
(C) Illinois University, Graduate School of Library Science, Monograph Series
(D) ESSO Magazine (published by ESSO Petroleum, LTD.)

15. Library personnel use the Union List of Serials primarily to determine _____.

(A) author's name
(B) the cost of subscriptions to technical journals
(C) the name and location of libraries that regularly receive and retain copies of serials and periodicals
(D) publishers of various journals

(The correct answers for the quiz are given on page 32.)

If you were able to answer most of the questions correctly you should read the remainder of this unit, and the next one, very rapidly. While most of the following material will be familiar to you, you may find some of the exercises and suggested techniques to be of interest and value.

If you were not able to answer many (or any) of the questions in the quiz, proceed carefully and you will be able to answer all of them, or at least you will know where to seek the answers, by the time you finish both units.

Turn the page and continue.

ULRICH'S INTERNATIONAL PERIODICALS DIRECTORY

Recall that our objective is not to become familiar with all the characteristics of these reference tools, but only with the characteristics that are particularly important for serials acquisition. Ulrich's (we will use this short name, from now on, for this two-volume directory) will be discussed first. It is especially useful as a source of information when your library wants to purchase (usually by subscription) serial publications. When you decide to subscribe to a magazine for personal use, you need to know how much it costs and where to send your money. Ulrich's provides this information (and much more) for thousands of serial publications from countries throughout the world.

Figure 1. Ulrich's International Periodicals Directory

1. Editions, Volumes, and the Entry: In Figure 1 you see that the complete directory set consists of two volumes:

- Volume 1 is entitled Scientific, Technical and Medical Periodicals
- Volume 2 is entitled Arts, Humanities, Business and Social Sciences

The set illustrated (and the one you will use in this unit) is the latest currently available, volumes 1 and 2 for 1967-68. Each volume is updated in alternate years; volume 1, of the 12th edition was published in June, 1967, but the 12th edition of volume 2 was published in 1968. In 1969, a 13th edition of Volume 1 will appear--and so on. Since two years elapse before one of the volumes is updated, a paperback supplement (to both volumes) is issued annually as an interim source of more current information. Figure 1A shows a typical supplement.

photo

Figure 1A. A typical supplement to Ulrich's

Figure 2 shows a typical entry--that is, a complete unit of information, of the kind that Ulrich's provides for thousands of serials.

ISIS; international review devoted to the history of science and its cultural influences. 1913. q. $10. Ed. Dr. Robert P. Multhauf. Johns Hopkins Press, Baltimore, MD. 21218. adv. bibl. bk.rev. charts. illus. index. circ. 2000. Indexed: Bio.Abstr. Chem.Abstr. Eng.Ind. Ind.Med. Math.R. Soc.Sci.& Hum.Ind.

History

Figure 2. An entry from Ulrich's , page 417, Volume 1, 12th edition

From such an entry we can learn a good deal about ISIS, the serial of interest in Quiz question 10. For example, the price is $10 (per year). It is published by the press at Johns Hopkins University in Baltimore. ISIS is published quarterly ("q." in the entry) and began publication in 1913. With this information you could place an order for ISIS and fill out a "checking card" for it as well. Your library probably uses some variation of the card shown in Figure 3 to check that serials are being received as ordered, and to record the dates of receipt.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1966		2/4			5/2			8/14			11/3		Publisher: Johns Hopkins Press, Baltimore, Md. 21218
1967			3/15		5/9			8/3			11/7		
1968		2/2			5/13				9/15				
1969													Price: $10.00/yr.
1970													Renewal: Jan.,1971 Source: publisher
TITLE: ISIS													FREQ: quarterly

Figure 3.A typical serials "checking card" with information obtained from Ulrich's and dates of receipt for a five-year subscription.

2. Searching for the Entry in Ulrich's:"Title and Subject Index": When you need to search in Ulrich's for information about a serial whose title you have--for example, ISIS--you would use the index of titles to find the page where the entry appears. Since we already know, from the information provided in the Quiz, that ISIS deals with science,the first decision is to use Volume 1. Beginning on p. 473, in that volume, you will see a complete list of all (Volume 1) titles, in alphabetical order. Take up Volume 1 and work this exercise.

Exercise 1

Use the Title and Subject Index to:

(a) Find the page containing the entry for ISIS. (Ans: page 417)

(b) Find the page containing the entry for Journal of the Association for Computing Machinery.
Hint: look it up under Association for Computing Machinery.
(Ans: page 70)

(c) Find how often the Journal of the Association for Computing Machinery is published.
(Ans: quarterly)

(d) Find the page containing the entry for the Journal of Mathematics and Physics.
Hint: this time search the index under the word Journal.
(Ans: page 253)

In case you are wondering--and you should be--how to select the proper words in a serial title to use in searching the index, the following rule will be helpful:

> Index Searching Rule: When the serial title includes the name of an organization such as that of a university, business corporation, government department, or professional society, search the index using the first word in that name, whether or not it is the first word of the serial title. When such a name does not appear in the title search the index with the first word of the title. (Ignore articles, like "The", or "A", when they are the first words.)

For example, to find Bulletin of the Virginia Department of Agriculture, search the index in Ulrich's under Virginia rather than Bulletin. However, to find Statistical Bulletin (which is published by the Metropolitan Life Insurance Company) search under Statistical since the company name does not appear in the title. You would

search for the Journal of the American Statistical Association under American since the name of a professional society appears in the title. However, the Annals of Physics appears under Annals. Try the next exercise and you will soon learn how to apply this rule.

Exercise 2

Search the "Title and Subject Index" and record the number of the page in Ulrich's containing the entry for each of the following serials. (Note: you may have already noticed that when the index shows more than one page number for a serial it is the underlined number that designates the entry page. Numbers that are not underlined merely designate other pages where that serial title also appears.)

(a) Journal of Agriculture. University of Puerto Rico. Page _____

(b) Annals of Physics Page _____

(c) IBM Journal of Research and Development
Hint: As you probably know, IBM stands for International Business Machines; notice that all titles beginning with "words" consisting of initials are arranged in alphabetic order in the index and precede other titles for each letter of the alphabet. Page _____

(d) Bell System Technical Journal Page _____

(e) Journal of Experimental Medicine Page _____

You will need to consult the index in Volume 2 for the next two serials.

f) Journal of the American Statistical Association Page _____

g) Statistical Bulletin, published by U.S. Securities and Exchange Commission.
Do not confuse this with the serial that has the same title but is published by the Metropolitan Life Insurance Company.) Page _____

If you were not able to find the answer to any of these questions, review the Index Searching Rule and try the exercise once more before continuing with 3, below.

3. Searching for the Entry in Ulrich's: "Key to Subjects": Usually, you are given only an approximation to the correct name of a serial, and have to begin your search with that. When you know this is the case you would probably be wiser not to search the index but to go directly to the list of entries. You may have noticed already that this list is organized according to major subject headings. On pages iii and iv at the beginning of Volume 1, you will find a complete list of these subject headings under "Key to Subjects". This key, (there is one for each volume) provides the beginning and ending page numbers within which all entries in particular subject matter categories may be found. These categories are a further breakdown of subject matter beyond the twofold separation into broad areas provided by Volumes 1 and 2.

The following case actually arose in an industrial setting and illustrates the great utility of the subject matter organization of Ulrich's entries.

A scientist, after returning from a visit to Japan, asked his company librarian to subscribe to a journal published in Tokyo. The information he supplied, from memory, follows:

"I am almost certain that the journal title is Annals of Statistical Mathematics. Incidentally, don't confuse this with the American journal, Annals of Mathematical Statistics--we already subscribe to that. This Japanese journal started publishing sometime after World War II, I believe."

The librarian, quite correctly, turned to the index in each volume of Ulrich's but was unable to find the title supplied by our much travelled scientist. (She thought about calling him to see whether he knew the name of the organization or professional society that sponsors or publishes the journal--why?--but decided to try something else first.) She turned then to the "Key to Subjects" on page iv of Volume 1, where she learned that entries for mathematics are located between pages 249 and 258. She began to scan the entries beginning with page 249 and on page 252 she saw this entry.

INSTITUTE OF STATISTICAL MATHEMATICS. ANNALS.
1949. 3/yr. Exchange Basis. Ed. K. Matusita. Japan Publications Trading Co., Ltd., C.P.O. Box 722, Tokyo, Japan. stat. circ. 400.

Figure 4. An entry from Ulrich's page 252, Volume 1, 12th edition

The librarian then called her "customer", who immediately confirmed that this indeed was the journal he had in mind.

Exercise 3

You have been asked to find a serial publication for an international project concerned with the teaching of mathematics. Use the subject mathematics in Volume 1 and scan the entries in this category to see if you can locate one that fits the description. (Hint: Notice that some entries terminate with an underlined word or two. These underlined words are an aid to scanning since they often provide a clue about the content of a serial. Watch for terms like "education", "teaching", "instruction", among the underlined words, as you scan.)

REVIEW UNIT 1

You have now almost completed your instruction in the essential features of Ulrich's. (There is one additional, and extremely important, feature that is described in the next unit.) In concluding this unit, a short review is provided for the major topics you have already covered.

- Ulrich's is a two-volume set: Volume 1 is used for scientific and technical serials including medicine; Volume 2 is used for those serials dealing with the arts, humanities, business, and social sciences.

- You may search in Ulrich's for the entry, systematically, in one of two ways:

(1) Use the list of alphabetically ordered titles, "Title and Subject Index", when you are reasonably sure that you have an accurate title; remember the Index Searching Rule (on page 25) to select the proper words of the title for search. Recall also that titles whose first "word" consists entirely of initials precede all others in the index, for each letter of the alphabet.

(2) Use the "Key to Subjects" and scan the entire set of entries in a particular subject category, or related categories, when you are not sure of the title, or when you have none, for the serial in question.

. For each serial listed, Ulrich's provides information including the following items:

(1) title
(2) publisher
(3) frequency of publication
(4) price
(5) abstract and index sources

The underlined items, 4 and 5 above, are distinctive features of Ulrich's. Among the major reference tools, only Ulrich's provides price and index or abstract sources. The use of the latter, 5, is explained in the next unit in connection with two other reference tools, Union List of Serials and New Serial Titles; these two overlap Ulrich's only with respect to items 1, 2, and 3, but they also supply vital information not available in Ulrich's.

If you can spare at least 15 minutes you should now begin Unit 2. Otherwise, continue when you have at least that much time to spare.

(End of Unit 1)

ANSWERS TO QUIZ - SERIALS UNIT 1

QUIZ ANSWERS

1 - C; 2 - B; 3 - B; 4 - A,C; 5 - B; 6 - B; 7 - B; 8 - A,B; 9 - C,D; 10 - C; 11 - began publication October 8, 1951; "CaBVaU 1-" signifies that the designated library (CaBVaU designates the library of the University of British Columbia in Canada) has a complete set of this serial and continues to receive it regularly; 12 - A,C; 13 - A; 14 - B; 15 - C.

EXERCISE ANSWERS

2: a - 48, b - 383, c - 71, d - 152, e - 290, f - 1105, g - 602

3. See the entry for INTERNATIONAL STUDY GROUP FOR MATHEMATICS LEARNING on page 252 of Ulrich's.

BIBLIOGRAPHIC TOOLS - SERIALS UNIT 2

NOTE: It is assumed that you will have completed Unit 1 before you begin this unit. If more than a few days have elapsed since you completed it, please refer to the review material on pages 30 & 31 in Unit 1 before you begin this unit. The booklet "Union List Excerpts" has been prepared to accompany this unit. This booklet contains reproductions of pages from the Union List of Serials, and must be used--in studying this unit--in place of the Union List of Serials. You will also need both volumes of Ulrich's International Periodicals Directory.

INTRODUCTION

This is the second unit devoted to serials reference tools. It has three main topics. First, the discussion of Ulrich's International Periodicals Directory, begun in Unit 1, is concluded with an explanation of the use of Ulrich's as a guide to indexes and abstracts for the contents of serial publications. Indexes and abstracts can be used to determine the precise bibliographic information (for example, journal title, article title, author's name, volume number, page numbers,) that is required for interlibrary loan requests, whether an entire volume is being sought or only a microfilm or photocopy of a particular article. The second topic in this unit is the use of the Union List of Serials in Libraries of the United States and Canada and its "companion" (for serials that originated after 1950), New Serial Titles, to find the library to which a loan or copy request should be directed. Finally, this unit gives you some advice about how to continue studying about serials on your own.

Ulrich's International Periodicals Directory - Conclusion

Ulrich's is a Guide to Indexes and Abstracts:[1]

A distinctive feature of Ulrich's, and a most important one, is the inclusion of index lists in the entry. For example, the last two lines of the entry in Figure 1 tell us that

> ISIS; international review devoted to the history of science and its cultural influences. 1913. q. $10. Ed. Dr. Robert P. Multhauf. Johns Hopkins Press, Baltimore, MD. 21218. adv. bibl. bk.rev. charts. illus. index. circ. 2000. Indexed: Bio.Abstr. Chem.Abstr. Eng.Ind. Ind.Med. Math.R. Soc.Sci.& Hum.Ind.
>
> History

Figure 1. An entry from Ulrich's, page 417, Volume 1, 12th edition

the contents of ISIS are indexed and/or abstracted in the following publications (which are serials themselves):

Biological Abstracts
Chemical Abstracts
Engineering Index
Index Medicus
Mathematical Reviews
Social Sciences and Humanities Index

[1] If the terms indexes and abstracts are vague to you, you will find it useful to read the explanations in the appendix on pages 45 & 46 before continuing.

(A complete list of spelled-out names, and their abbreviations, for all indexes and abstracts sources that appear in Ulrich's entries may be found on page xi in Volume 1 and page xxv in Volume 2.)

The word History which appears underneath the entry for ISIS is a cross-reference. It tells a user who is interested in the journal that other items of interest may appear under the subject heading History.

In the introduction to Unit 1 the following question was listed as one that could be answered by using Ulrich's:

Exercise 1

Your supervisor needs bibliographic information (volume number, page numbers, title, date, author's name) for an article on metal rusting, which appeared some time ago in Science, in order to request a photocopy of this article from a large university library. Use Volume 1 of Ulrich's to find the names of two index (or abstract) sources that are likely to contain this information. Write the names below, spelling them out completely--no abbreviations.

_____

_____

Many serial publications are not well indexed or abstracted. This is particularly true of technical journals of recent origin and of those that have small circulation. The Annals of the Institute of Statistical Mathematics, for example, is not indexed anywhere; if you look at the entry for this journal in Ulrich's, you will see that its circulation is very small.

Exercise 2

In the next section you will learn about union lists. One of these lists is a serial publication of the Library of Congress called New Serial Titles. Before proceeding, use Ulrich's to find out all you can about this publication, which is used to select a library where a request (such as that mentioned in the previous exercise) may be sent.

This exercise concludes your formal work with Ulrich's.

Union List of Serials in Libraries of the United States and Canada

and

New Serial Titles

The Purpose of Union Lists

Even a casual glance at Urlich's (which itself covers only a sample of existing serials) is enough to convince you that no library can attempt to acquire and store more than a limited number of serials. Furthermore, there are many serial volumes that are no longer available for purchase, and even a very large, but relatively new, library may not have these older issues.

Faced with these problems, librarians concluded that only by sharing their serial holdings could they reduce the cost to individual libraries of serial acquisitions, and at the same time provide better service to readers. Thus, "unions" of libraries evolved. Libraries that are members of a union agree to list their serial holdings for publication in a "union list" that is circulated widely. There are many such union lists, varying from small ones to extremely large ones. Figure 2 shows two very large and comprehensive lists.

photo Union List of Serials

New Serial Titles

Figure 2. Two examples of union lists

The five-volume set on the left, Union List of Serials (the rest of the name is usually omitted both in written and spoken reference to it) lists more than 100,000 serials that began publication before January 1, 1950 and that are held by nearly 1,000 cooperating libraries in the two countries. The two-volume set on the right is a cumulation of the annual issues of New Serial Titles; it is a "companion" to the Union List of Serials, and lists serials that began publication on or after January 1, 1950. In the next section you will become more intimately acquainted with the use of the Union List of Serials. You will need to refer to the booklet called "Union List Excerpts".

Union List of Serials

You have already seen, in Exercise 1, how Ulrich's may be used to locate an indexing source that would locate an article in the journal Science. But now suppose your library does not subscribe to Science, or that its holdings do not go back far enough to include the required volume. The Union List of Serials serves you at this point (rather than New Serial Titles, because, according to Ulrich's, publication of Science began before January 1, 1950) with a list of libraries that hold the required volume.

Exercise 3

(a) Turn to the section called "COOPERATING LIBRARIES," pages 1-6, in your "Excerpts" booklet. There you will see, for every State in the union (and for Canada), the symbol designators of the "union member" libraries. Look over the libraries listed for your State and determine which of them provide services such as: "furnishes photocopies," etc.

(b) The Union List of Serials entries for the Annals of the Institute of Statistical Mathematics and ISIS are on pages 20 and 21, respectively, of the booklet. Write the full name of a university library in Iowa and the extent of its holdings for ISIS and for the other serial (refer to "Sample Entry 2" on page 17 of your "Excerpts" booklet before beginning):

_____

_____

New Serial Titles

New Serial Titles appears in 9 monthly and 3 quarterly issues and is cumulated annually, quinquennially (at 5-year intervals), and decennially (at 10-year intervals). Figure 3 shows the paperback issue for January-March, 1968, and, to its left, the bound annual cumulation for 1966.

photo

Figure 3. Annual cumulation and quarterly issue of New Serial Titles

The information contained in New Serial Titles parallels that in the Union List of Serials in both content and format. The decision whether to use the Union List of Serials or New Serials Titles to find information about serial holdings depends only on the date on which publication of the serial began:

- Before January 1, 1950: Union List of Serials
- January 1, 1950 or later: New Serial Titles

Union Lists and the Acquisitions Process

The preceding exercises and discussion have covered the most important purpose and use of these lists: to locate a library that has a given volume, or volumes, of a particular serial. However, these lists also serve another purpose. A library's decision to purchase a given serial will depend, in part, on the estimated demand for the serial and also on its availability from other libraries. Union lists play an obvious role in such decisions and in a similar situation that arises because libraries are often recipients of gifts consisting of serials.

Limitations of Union Lists

It is quite likely that your library does not subscribe to New Serial Titles and may not have copies of the Union List of Serials or of New Serial Titles cumulations. Nevertheless, it is important that you be aware of the information provided in these reference tools, and of the limitations on this information. For example, many large libraries have extensive holdings of certain serials, yet New Serial Titles or the Union List of Serials entries may not indicate this. As a general rule, the holdings of fewer than 20 libraries will be shown for a given serial. (You can see an exception to this on the last page of your "Excerpts" booklet; see the entry there for Science.) Thus, it is always worth a call, or letter, to a neighboring large library to determine whether

they have a serial that you need. If they do not have the serial, they probably do have the various union lists.

Suggestions for Further Study

A good way to review and to see how much you have already learned (and what you may not yet have learned) is to repeat the Quiz in Unit 1. For some questions you may wish to refer to Ulrich's or to your "Excerpts" booklet; feel free to do so.

Here are some suggestions that may help you in further study:

- Read the introductions and the prefaces in Ulrich's and the "Excerpts" booklet and note what serials are excluded from these works.

- Scan a few entries in the "Excerpts" booklet and see if you can decipher all the abbreviations and coded information. Check in the Introduction, Preface, Explanations, and Sample Entries sections of the booklet for the information you require. Do a similar exercise in Ulrich's. (This is one of the best ways to develop a "feel" for these reference tools.)

- Keep a notebook where you can record facts you are likely to forget--and especially those you discover on your own, while on the job or during study.

Read in some of the standard works on reference tools and serials. You will find these two books to be quite useful:

Guide to Reference Books, Constance M. Winchell. Chicago: American Library Association, 1967

Serial Publications, Andrew D. Osborn. Chicago: American Library Association, 1955

(End of Unit 2)

APPENDIX - UNIT 2

INDEXES AND ABSTRACTS

Indexes

Most of us first became acquainted with an important index to the contents of serial publications, Reader's Guide to Periodical Literature, in high school when we needed background information for an English composition or a term paper. We could turn to this guide where location information (magazine title, volume number, page numbers) is available, for articles dealing with a particular subject, across many magazines. The Reader's Guide is an index--that is, a file of such location information in various convenient arrangements: in this case, by article title, by author's last name, and by subject.

Indexes vary from the very specialized ones to quite general ones. The Reader's Guide is general, in the sense that it indexes the contents of a large number of magazines that, for the most part, deal with "popular" subjects and have relatively large circulation: Harper's, The Atlantic Monthly, Saturday Evening Post, etc. The most specialized index would be one which covered the contents of only a single serial publication. Many technical journals, and even some popular magazines, publish such indexes (The entries in Ulrich's include an item that tells you whether this is the case for a particular serial.) There are other less restricted, but still specialized, indexes whose coverage is limited to the

serial literature in engineering--for example, Engineering Index, or, in medicine, Index Medicus; similar indexes are published, serially, for many other fields, ranging from education to meteorology.

Abstracts

An abstract, as you know, is a brief summary, usually no longer than 200 words, of the main ideas in a technical paper or magazine article. (Many scientific societies that publish technical and scientific serials now require the author to submit an abstract along with his submitted paper or article.) Among the most valuable serial publications are specialized collections of abstracts, such as Mathematical Reviews, Chemical Abstracts, and others. These offer the reader the location information provided by indexes and, in addition, a basis for deciding whether the "located" article or paper is pertinent to his interests and requirements.

SERIALS UNIT 2 - EXERCISE ANSWERS

1. The appropriate entry for the journal Science appears on page 423 of Vol. 1 of Ulrich's. The two abstracting services you would ordinarily use are Metallurgical Abstracts and Meteorological and Geoastrophysical Abstracts. It might also be useful to search Chemical Abstracts, since rusting is a chemical process. If you had the actual name of the article or the author it might be most efficient to use the index that is published by Science itself. (Notice the entry indicates that such an index in available.)

3.(a) The services that a library provides are encoded in the letters L, L*, P, and M enclosed in parentheses following the library name. See the top of page 1 in your "Excerpts" booklet for an explanation of these codes.

3.(b) According to the Union List of Serials, the library at the Iowa State University of Science and Technology at Ames has a complete set of both serials, beginning with Volume 1 for each (this fact is denoted by the symbols, "IaAS 1+", that appear in the library holdings listed within the entries for these serials). The library at the State University of Iowa, also at Ames, has a complete set of ISIS, but not the other serial.

31 October 1968 TM-3962/001/00

INTRODUCTION TO SERIALS INDEXING AND ABSTRACTING SERVICES

Photo of

Engineering Index

Science Abstracts A. & B.

Applied Science and Technology Index

Figure 1

PRELIMINARY QUIZ

On a Separate Piece of Paper, Try to Answer the Following Questions as Quickly as you can.

1. Give two reasons why abstracting indexes are important.
2. Name two different types of abstracts and give a brief definition of each.
3. Give two basic differences between the Applied Science and Technology Index and the Engineering Index.
4. What major change has been made in the arrangement of material in Science Abstracts in the last ten years?
5. What index would you look in for material on air pollution? Indicate why you chose that index in preference to some other index.
6. Give two basic ways in which the abstracts can be arranged.
7. What kinds of indexes are useful to supplement the basic arrangement of an abstracting index?
8. Give two basic differences between Engineering Index and Science Abstracts.
9. How soon after an article is published can one expect to find it indexed in an indexing or abstracting service?
10. In addition to the abstract, what other clues in the reference indicate the possible value of the article to your literature search?

11. What is the frequency of publication of:
    a. Chemical Abstracts
    b. Electrical and Electronic Abstracts
    c. Mathematical Reviews
    d. Nuclear Science Abstracts
12. Name the sections of Science Abstracts.

If you have had no difficulty with these questions, you probably will not need to study the following units. You will find the answers on page ____.

INDEXES TO SERIAL PUBLICATIONS

Serials are publications issued in some kind of sequence, at regular or irregular intervals of time, for an indefinite period of time. (Thus books issued in several volumes, are not considered to be serials.) Serial publications can be periodical journals or magazines, annual proceedings, serially numbered documents or reports, and daily newspapers. In this study unit, we will limit our discussion to the category of periodicals.

The word "periodical" indicates that these publications are issued periodically. Most of them are issued monthly, bimonthly, or quarterly. These can be divided into popular and semi-popular magazines, and scholarly, technical, review, and indexing and abstracting journals.

A popular magazine, such as Popular Mechanics, is one of general interest to the public and is written in an easy-to-understand style. A semi-popular magazine, such as Scientific American, is for the intelligent layman and may be written in a slightly more scientific or technical style. A scholarly or technical journal, such as American Historical Review or Datamation, is intended for specialists in a particular field and is apt to be written in the jargon of that field. A review journal, such as Harvard Educational Review, contains articles reviewing recent developments or the current state-of-the-art of a particular field; these articles are often accompanied by lengthy

bibliographies of the pertinent literature. An indexing journal, such as the Readers' Guide to Periodical Literature, indexes books and articles in a particular field (such as education) or of a particular type (such as periodical literature) by providing bibliographic citations under various headings. An abstracting indexing journal, such as Chemical Abstracts, not only indexes literature but also includes abstracts or short summaries of the literature.

If you can, give the title of another periodical in each of the following categories:

Popular_____
Semi-popular_____
Scholarly_____
Technical_____
Review_____
Indexing_____
Abstracting indexing_____

This unit of study is intended to develop your knowledge of indexing and abstracting journals as a class of reference sources, and with some indication of their importance, scope, peculiarities, and use.

There are many estimates of the extent of periodical literature. There are probably some 50,000 current serial

titles in science and technology issued throughout the world. Chemical Abstracts issued some 300,000 abstracts during 1967, taken from 11,000 journals, over 50 languages, from 100 countries. Probably, close to 3,000,000 scientific and technical papers are now being published each year.

The keys to this vast source of information are the indexing and abstracting services, by means of which the contents of these thousands of journals can be searched by author and/or subject. The needs for up-to-dateness, completeness, and accuracy of the indexes put heavy pressure on these services to maintain current, effective, and specific indexes. The problems that arise in providing such services are challenging the ingenuity of those who work in the field of library and documentation systems.

Indexes to journal literature differ in some important ways from indexes to report literature. Since technical reports are project-oriented, not subject-oriented, technical reports indexes tend to emphasize the names of agencies where work was done. Furthermore, technical reports are often written in detailed, specialized language that is difficult to index. Many indexing services employ technically trained persons to convert the specialized research language into more general index terms to facilitate searching.

Indexing schemes for journal articles should provide a subject approach that is both organized on broad lines and capable of pinpointing specific subjects. Author indexes are important, especially in annual cumulations of the indexes. Abstracts and accurate citations are essential for most effective use of such indexes.

List two indexing or abstracting journal titles and give a brief description of their organization and useful features.

_____

_____

_____

_____

_____

_____

There are probably more than 4,000 world-wide scientific abstracting and indexing services at this time, with more being added as new publications and new specialized subjects develop. The knowledge necessary in doing wide reference work with these indexes is not easy to come by. Even after some indexes have become familiar through frequent use, the reference worker must be aware of changes in coverage, indexing format, and frequency, expecially where indexing services are experimenting with new techniques.

Choosing services to look into for any given search requires knowing what services are available, what they represent, and how they relate to each other. Here are some general points to consider on coverage:

a. Some large services provide very broad coverage over a wide range of the literature, but such coverage is often not "in depth" (that is, exhaustive) in any one subject area.

b. Some larger services tend to cover the "key" journals--those containing a high proportion of contributions judged most important in the field. This means that these key journals are covered by many indexing services, whereas new or specialized journals may not be covered by any of the major indexes.

c. More specialized services, limited to a specialized subject, provide more in-depth coverage of more specialized publication, with more specific index terms and often through a carefully developed classified arrangement. The more specialized services, therefore, are usually the most useful in pursuing an exhaustive search.

d. A few comprehensive indexes attempt to keep up with the world-wide literature in their fields, no matter how much is published. An outstanding

example of this is Chemical Abstracts. The 1967 issues fill 40-1/2 inches of shelf space, compared with only 18 inches for 1957. In contrast, the Engineering Index, which is more selective, has been maintaining an annual 3-inch thickness for many years through 1962. In 1963 it split into 2 volumes. By 1967 the two volumes totalled 6 inches.

e. If only the more important or more general articles are desired, a more general index will be adequate. But general indexes should also be searched for special subjects, in combination with specialized indexes, since articles of special interest do appear in many of the journals covered by general indexes.

In addition to coverage and overlap, one must consider time lag from the time information is published in a journal until it is indexed in an indexing or abstracting service. This may vary from three months to three years. To determine the extent of the time lag, it is important to scan new issues of indexing journals to see what the dates of the articles are that they cover. If very current information is wanted, one must go directly to the journals likely to contain pertinent articles, since they will not yet be included in the indexes.

In the introductory statement we indicated that indexing journals can give bibliographic citations with or without abstracts or summaries of the contents of the articles. Those without abstracts have limited value, since the only description is the title itself. Abstracts may merely indicate what articles are about, or they may be more informative, giving specific important details and/or data. Some indexing services go even further by providing extensive summaries or digests of the articles and critical evaluations of methods or results.

The sole purpose of an abstract is to allow a searcher to make an accurate determination of the value of an article for his needs. A good abstract will enable him to either accept and use the information and go no further decide he needs the entire article for further information, or reject the article as not being pertinent. A poor abstract may lead him to reject an article that is actually pertinent but never know it; if he accepts an article on the basis of a poor abstract, he will discover the error as soon as he scans the entire article. It is, therefore, necessary for the searcher to be aware of the quality of the abstracts of indexing service.

Before beginning a search for articles in a subject that you are not familiar with, it is helpful to familiarize yourself with the subject. A good textbook, handbook, encyclopedia, or similar source on the general subject can often give you a quick overview of the subject and

indicate the special relation of the specific subject to a more overall subject. This preliminary orientation will also help you to recognize the subject's special vocabulary, the origin and applications of the subject, and its best-known authors, as well as other pertinent information. For example, if you can determine the approximate date we when a new subject was first developed or likely to have been written about, you can limit your search to indexes that were prepared after that date.

The goal in studying examples of indexes in this course is to learn how to go about becoming thoroughly and quickly familiar with any index. What are the points to consider and how can you best find out? There are several basic features that one must learn about each index in order to make the best use of it:

1. Basic arrangement--alphabetical, topical, classified (Dewey, LC, etc.).
2. Number and kinds of journals covered.
3. Scope of subject area included, including topical emphasis and point of view.
4. Depth of indexing. General terms vs. very specific terms.
5. Duplication of indexing under more than one term or entry.
6. Inclusion of abstracts. If yes, how specific and informative are they?

7. Up-to-dateness of coverage, or time lag.
8. Frequency of issue and frequency of cumulation.
9. Indexes other than main approach, such as specific alphabetical subject-term index to a classified or topical arrangement, or author index, etc.
10. Consistency of the indexing. Will you always find the same subjects under the same indexing terms?
11. Does the indexing vocabulary change to reflect current terminology?
12. Cross references, both "see" and "see also," from one topic to another.
13. Any other special features, such as coverage of foreign publications, lists of abbreviations, lists of journals covered, etc.

Here are some general procedures to establish familiarity with a new index:

1. Read the introduction and any associated material describing the coverage, indexing features, abbreviations, etc.
2. Check for time lag by seeing how recent the references are.
3. See if vocabulary or indexing terms are readily understood or if you may need a dictionary specialized in that area.

4. Take some examples of indexing entries and citations and make sure you understand all the notations and abbreviations. If you don't, find a list of abbreviations, perhaps in the first issue or an annual issue.
5. Is there a list of journals and other sources indexed? Is this list added to in subsequent issues? How often is the complete list published?
6. Check the basic features mentioned above, so that your basic knowledge of the index will become clear and almost second-nature.

Certain techniques are useful in conducting any literature search, in addition to the more general procedures mentioned above.

1. If you don't find material under the first word you look up, follow cross references, if any, or try to think of another term under which material might be found.
2. If you are still having difficulty in finding the correct subject term, go to a special dictionary, which will define the subject and give you a better idea of related terms and subject fields.
3. If you are uncertain about the possible value of an article, look to see how many pages it has and if there is any mention of additional references

in the article. A 20-page articl is likely to be more informative than a two-page article, and a four-page article with a bibliography listing 20 references may be better than a seven-page article without any references.

4. Look for clues as to fields of application, related or more specific subjects, journals that seem to specialize in articles on the subject, new journals in the field, references to conferences on the subject, new terminology in recent references. If you can store this kind of information in the back of your mind, it will be easier for you to conduct a literature search at a later date, when this subject comes up again.
5. If you already have an article on the subject in question, look up the author in the author index and find how that article is indexed by subject. This may help you to locate the proper subject terms to use.

We will take two indexes as examples and try out some of these learning techniques with them. These are Engineering Index and Science Abstracts, both of which are broad-coverage services available in many libraries.

Photo

Contents pp EI and S.A. Sect A.

Figure 2

Here are some facts about Engineering Index (EI) that you should keep in mind in using it.

Engineering Index is issued monthly, with an annual cumulation. The time lag is considerable. The most recent references in monthly issues are at least three months old, and the monthly issue itself is received in a library at least one month after the date of the issue. The annual volumes for a calendar year are not received until August of the following year. This means that there are 18 individual monthly issues just before the annual volumes arrive. The most recent references in the annual volumes are at least 11 months old by the time a library receives the volumes. Many references are three years old. Therefore, in searching EI for material that you believe was published in a certain year, you might need to search through the indexes for that year and at least two subsequent years.

Engineering Index is a subject index to abstracts of articles on engineering and technology. Some of the topics covered are only loosely related to engineering. EI abstracts conferences, symposia, books and reports as well as articles appearing in journals. It has an author index that refers to a page number only--thus it is necessary to scan an entire page to find the correct article.

Stop here and examine the Engineering Index. The next unit of instruction will give you some practice in using the Index.

USING

ENGINEERING INDEX

The following exercises are to be done by consulting the 1967 volumes of Engineering Index. Whenever the phrase "find an article" is used, this means find a reference to an article and give the title, first-named author, and bibliographic citation as you find it (for example, Underwater acoustic camera. R. W. G. Haslett. Acustica v 17 n 4 1966 p 187-203).

1. Does Engineering Index include papers given at some conferences and symposia?_____ How do you know this?_____

_____

2. Where can one obtain copies of the articles cited?_____

_____

3. What is the full name of a journal cited as "Instn Elec Engrs - Proc"?_____

_____

3a. How did you determine this?_____

_____

4. Find an article on lighting of libraries.

_____

_____

5. Does the abstract give a lot of data?_____
6. Find an article by T. Okada on plastics.

_____

_____

Give two reasons why you think this would be a good article to obtain for further details.

_____

_____

_____

7. Find a recent article on lunar television cameras.

_____

_____

What is the full name of the journal?_____

_____

8. What publications series from the University of California are indexed?_____

_____

_____

9. Where is the magazine Machinery published?

_____

_____

10. What is the name of a magazine from Prague, Czechoslovakia, that is indexed by Engineering Index?_____

_____

11. Look at references under FLUID AMPLIFIERS.
    a. What is the earliest reference (bibliographic citation) you can find?_____

    _____

    b. What is the most recent reference (bibliographic citation) you can find?_____

    _____

c. Find an article in French._____

_____

_____

d. Find an article containing an extensive bibliography on the subject it discusses.

_____

_____

_____

e. Find a reference to a paper presented at the Joint Automatic Control Conference in Seattle, 1966._____

_____

f. Find an article with the title "Understanding Fluidics."_____

_____

g. Name two other subject index terms under which there are references on fluidics.

_____

_____

h. Find an article by W. K. Clark on fluidics.

_____

_____

Did you use the author index to find this?

_____

i. Name a magazine title that has at least three articles on this same subject._____

_____

_____

Stop here. The next unit of instruction will introduce you to Science Abstracts.

INTRODUCTION

TO

SCIENCE ABSTRACTS

Before going on with this unit, you may find it useful to review the list of basic features and procedures to note and use in learning about any index given on pages 59 to61.

Science Abstracts is published in three sections: A, Physics Abstracts, B, Electrical and Electronics Abstracts, and C, Control Abstracts. Each section is issued monthly, and each section has two semi-annual author and subject indexes. The time lag is often more than a year because of the extensive coverage of foreign publications.

The arrangement is by subject categories, according to a classification system worked out by the publisher. Each issue also includes an outline of the classification system, an alphabetical list of subject headings used in Science Abstracts, with references, by code, to the particular series and "chapter" (major category) in which that subject is included.

Once a year, in the author index, a list is published of the journals and reports to which references are made. There is also a list of the journals that are abstracted completely, as well as a list of books and conference proceedings that were abstracted. These lists are supplemented in the monthly issues, which also contain an author index.

There are a number of differences between Engineering Index and Science Abstracts.

Engineering Index	Science Abstracts
Approach is alphabetically by subject heading. Related material is scattered.	Approach is by classified subject categories. This tends to being related material together.
More general coverage, since engineering is an applied science based on several fundamental sciences.	More specific coverage, since it focuses on specific sciences.
One annual cumulation, plus current monthly issues.	No annual cumulation. If approach is by subject categories, you must look in twelve issues per year. Even if you use the semi-annual subject index, the references will be scattered in up to six issues, or twelve issues for the year.
In general covers English-language journals of a technical nature.	In general covers world-wide literature of a scientific and scholarly nature.

Engineering Index	Science Abstracts
Abstracts are brief and more descriptive, and can generally be understood by a non-specialist.	Abstracts are longer and contain considerable technical data which may be difficult for non-specialists to interpret.
There are more subject headings for pinpointing specific subjects. Also, each subject heading appears with the references and abstracts, thus helping to define the subject.	The classified approach requires some knowledge of the subject fields. The number of subject headings is limited. To make sure what a heading means, one must turn to the pages where the abstracts appear.
Abstracts are anonymous.	Some abstracts are signed.

Using Physics Abstracts

The following exercises are intended to provide some familiarity and learning experience with one of the sections of Science Abstracts. Use the June 1968 issue and the Author Index, January-June 1968, of Section A, Physics Abstracts.

If the entire issues are not available, obtain copies of the following pages, June 1968 issue: Inside front cover, Combined List of Subject Headings (2 pages); pages lvii, 1506, 1516-1520, 1534, 1539, 1666, 1667, 1740, 1751, 1771. Author Index, January-June 1968: A1, A283, A284, B1, C1.

1. What is the meaning of the number 8 following all author entries in the author index?
2. Find an article by S. Tanaka that he wrote without any other author.
3. Find the reference number for a review of the book: "Annual Review of Nuclear Science," vol. 15, edited by E. Segre.
4. On what pages in the June issue is there material on the solar system?
5. Find an article by Yu and Young.
6. What is the full title of a journal listed as Avtomat. Vychislit. Tekh.

7. Who is the publisher of the Conference Record of the Sixth Photovoltaics Specialists Conference, Cocoa Beach, Florida, 1967, vol. 3?
8. Find an article on heat transfer in laminar flow of incompressible liquid in a circular tube.
9. Give two specific subject category numbers of material on dielectrics.
10. What is the current title of a magazine formerly known as Revue Technique Companie Francaise Thomson-Houston?
11. In the June issue look in section on "Heat."
    a. Find an article dated 1965.
    b. What is the arrangement of articles under this category?
    c. Find an article appearing in a Dutch journal.
    d. Find an American journal that has two or more articles on heat.
    e. What is the title of the journal containing the English translation of articles from Inzhen. Fiz. Zh.
12. Give the authors of two papers presented at the Seventeenth Electronic Components Conference, Jackson, 1967.

As a further exercise, review again the list of basic features and procedures on pp. 59-61 and, using these guides, familiarize yourself with the Applied Science and Technology Index.

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Fowler, Maureen J. Guides to scientific periodicals. London, Library Association, 1966.

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Continues work reported on in TM-3762/000/01 and TM-3962/000/00. This project is conducting research and development to construct, pilot-test, modify, field-test, and evaluate experimental instructional materials responsive to training requirements for personnel in scientific and technical libraries. The objectives of the instruction include improvement in the knowledge and skill of library personnel at both professional and nonprofessional levels and consideration of the relative efficacy of different media and techniques of imparting such instruction. The initial efforts of the project relate to the training requirements of scientific and technical libraries and involve three instructional sequences. The firs sequence deals with the role of technology in libraries. It concentrates on system analysis and is directed toward professional librarians. The other two sequences, which are intended for nonprofessional library personnel, present instructional in reference tools and services and Russian transliteration.

This current report presents a summary of the work to date, including a review of past progress, a description of the instruction packages developed to date, and an experimental design for field testing of the developed instructional materials. The Appendix contains examples of the developmental materials for serials reference work.

A-2735

14. KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Library personnel training						
On-the-job training						
Technical libraries						
Librarians						
Instructional materials						
Russian transliteration						

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