THE COMPONENTS OF THE SCIENCE COLLECTION

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Previous papers have discussed the various aspects of science literature for general reading so presumably all previous steps already have been taken into consideration when the basic ingredients of the collection--or components, as the term appears in the title of this paper--are analyzed. This phrase, somewhat anticlimatic, lands the author somewhere on the circumference of a circle--perhaps that vicious one containing the chicken and the egg. Or to put it another way, some may feel that we had the "cart before the horse"--that, for example, one does not select until he knows what to select for whom, why, when, how, and where.

Much time could be wasted on the question of priorities but, since this is the last discussion in the second series, we cannot turn back and start all over again. Let us proceed, therefore, to think about the composition of the collection, built or re-built, in the light of what the reading public wants, where to get it and how, as well as of other types of materials the general reader might use to advantage once he becomes aware of their existence. In this paper some suggestions may, of necessity, emphasize those made by previous speakers; in fact, they may be repetitive in spots. On the other hand there may be some difference of opinion. By this time one gathers that the general reader is a person of ordinary intelligence who has not had recent training nor, up to now, specific knowledge of the subject in which he has indicated an interest.

In order for us to be thinking about the same types of materials which form the components of the science collection, it is wise to formulate a definition of science for the purposes of this discussion. The word "science" may have different meaning for different people. It covers everything known in the

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past about nature as well as the new facts constantly supplemented by scientists. It could be the knowledge of heavenly bodies, of chemical compounds, of minerals, of plant life, and all other phenomena which make up the world in which we live --any phase of pure science. Then there are the practical uses in which discoveries are used by man. These affect our daily existence in one way or another--jet planes, stronger metals, maps of the Arctic regions, insecticides, and perhaps a new drug to fight a hitherto unconquerable disease such as poliomyelitis. In other words, the term covers both the pure and applied sciences. The definition can be broadened sufficiently to include career information in scientific fields which ordinarily might be classed with education. It may also include some hobby and how-to-do-it information although no particular stress will be placed on these categories in which there is great reader interest as was pointed out earlier by John T. Thackery.

The components are a composite of many conditions and many pressures and the resulting collection represents the negotiation of many roadblocks. Before breaking down the collection into categories to be considered for various types of libraries--school, college, and public--it may be helpful to review some of these roadblocks to achieving a balanced collection. Some may have been touched upon in earlier papers and not all are applicable to all three types of libraries.

Let us begin with the librarian rather than the clientele. Mary L. Bundy and Hilda Womack[1] set out to collect information which would form the basis of a discussion of the significance of the reading done by public librarians. They felt that librarians conduct and sometimes use studies of the reading interests of the clientele they serve but little is known about what is read by the librarians themselves. In the 63 per cent usable response to a written questionnaire they found that only 6 per cent read often in the fields of science and technology. When fiction and nonfiction are put together and all subject fields ranked in decreasing order, according to the amount of reading reported, neither science nor business is found among the top ten.

If the librarians who answered the questionnaire are typical, as a group they are readers of books, but their reading tastes undoubtedly continue a pattern begun early in life. This background can limit their usefulness in building a well-rounded collection to help the reading public "keep up with a technological, industrialized, crowded, complex, and constantly changing, shifting society" for which they will need a special sense of direction. The study concludes with the observation that librar-

ians are not consciously using books to give themselves this special sense of direction so that they, in turn, can help their fellow citizens, both separately and together, to orient themselves to changing conditions.

In our larger academic institutions, C.H. Brown[2] said some have been found in which every professional member of the library staff had majored in the humanities thus the administration of these libraries is determined more by an approach to the humanities than to the sciences. He feels that "an understanding of the sciences, even if superficial, seems necessary for every librarian, since he may be called upon not only to assist research scientists, but also to give information to the many concerned with scientific advances, as well as to scholars in many fields of the humanities who are affected by recent scientific discoveries."

Another roadblock is the problem of communicating science to the layman. Perhaps we have far too few scientists writing good books. Each branch of science has developed its own terminology so it is difficult to translate it into words which can be understood by the general reader. There is the amusing story, for example, of the man who received a gift book by Einstein on the theory of relativity but confessed to the donor that, although he could identify all the words, as he tried to read he could not understand any of the sentences. Then too, due to the splintering of science, it is becoming increasingly difficult for one scientist to understand another. Here we need only to be reminded of President Hutchins' complaint about the anatomists teaching at the University of Chicago who were so specialized they could not speak intelligently to one another unless they were working on the same parts of the body. On the other hand, scientists are becoming more and more aware of the interdependence of the sciences and they never know when a discovery in one field might affect the result in what they are trying to accomplish in an entirely different one, so it behooves them to read widely for information just as it does the layman. Turning the tables, perhaps you have heard the story bandied around among physicians who complain that they cannot understand what disease the patients think they have until they check the most recent issue of the Readers' Digest which has sent the patients to them.

A third roadblock may lie in the negative attitudes in the minds of readers which steer them away from science. The forty-fifth survey of a series called the Purdue Opinion Panel, conducted by the University's Division of Educational Reference,[3] was given by high schools to approximately 15,000

students who recorded their answers anonymously, then the data were tabulated on IBM machines. This survey dealt with physical science aptitudes and attitudes toward various occupations ranging from sales clerk to atomic scientist. A sample of 2,500 replies was drawn, and, when occupations were considered as social institutions, housewife and physician tied for first place; psychologist and storekeeper for eighth. Last place was delegated to the atomic scientist which may reflect a poor understanding of the scientist and his work. As a possible vocation, the atomic scientist tied with the psychologist for fifth place. Questions phrased in the stereotypes of scientists drew replies which were not encouraging such as: 14 per cent thought there was something evil about scientists; 28 per cent did not believe scientists have time to enjoy life; 35 per cent felt it necessary to be a genius to become a scientist; 25 per cent thought scientists, as a group, are more than a little bit "odd"; and 27 per cent were convinced that scientists are willing to sacrifice the welfare of others to further their own interests. If parent attitude is reflected in student opinion, it is little wonder that libraries are not deluged with demands for material on pure science and the situation can hardly fail to influence the supply of technically-trained graduates. From this comes the realization that science training must begin in the elementary school.

On the other hand, a recent news release from Lehigh University[4] indicated that books on pure science, which had the highest circulation the previous year, were second in popularity during the 1959-60 academic year with 13,998 on loan. This field led in acquisitions with 2,089 titles added. Among public libraries there is little documentation to indicate reader interest in science although, in talking informally with librarians, one receives the impression that demands have increased in specific areas. An examination of statistics usually indicates that circulation of science items is buried among nonfiction items which, in proportion to the fiction statistic of approximately 65 per cent reported by B. R. Berelson[5] over a decade ago, probably has not changed materially as much to date as it will in the future. From one member of the American Library Association's Library Community Project came word that his library had increased its science book circulation figure 50 per cent in comparing figures for 1959 with those for 1957.

If librarians wish to learn about reader interest in science from an objective viewpoint, a report of a survey made for the National Association of Science Writers is a source.[6] During the spring of 1957, 1,919 American adults, selected to rep-

resent a cross section of the public, were questioned at length about their habits, attitudes, and opinions. Results showed that those interviewed got their science news primarily through newspapers; television and magazines rated close as the next most popular medium while radio was mentioned by only 4 per cent. A special question asked about the use of books, including paperbacks, as a source of information, showed that 8 per cent of adults read at least one book during the past year that included some science reporting. Books were cited as a source of useful science information by approximately one person in every one hundred. This is not so discouraging as it first sounds because this survey was concerned with science news when it is news rather than with retrospective science information. It is also well to keep in mind that science writers must sell their stories to editors. One such writer explained that it would be easier to sell an editor a story about his kidneys than about archeology unless the Indian arrowheads were unearthed in the editor's own back yard.

Although there are many other deterrents to a major increase in the demand for science materials at present, there is only one more roadblock which will be mentioned here--that of the need for selective, annotated lists of books by authors particularly successful in conveying factual knowledge to their readers such as Lancelot Hogben's books on mathematics. To this end, the Special Projects Committee of A. L. A. 's Adults Services Division has been working on a proposal for a series of reading guidance booklets which came out of an inquiry from the Carnegie Corporation.[7] At least three of the six proposed are to be done in the science field--all in the style of the old "Reading With a Purpose" series, to be available for distribution to individual readers. This project, when carried to completion, should aid the reader in choosing books which will help him understand our age in which political, economic, and social decisions are tied to scientific progress--when our very lives are dominated by science. Just one year ago our vision of Thanksgiving turkey was clouded by the uproar over cranberries which were suspect. Scientists devise new textiles so they influence what we eat as well as what we wear. As for what we drink, we still read of local controversies regarding the fluoridation of drinking water. People do wonder where to go to get the facts about what they read in the newspaper and see on television. They also wonder about the future and would like to know of logical developments such as those discussed in Sir George Thomson's The Foreseeable Future along the line of communication, power supply, and food--even to the possibility

of using trained monkeys for repetitive jobs in industry. The general reader needs to know of this author, for example, and that his book requires no previous scientific knowledge for understanding.

Books

Because books traditionally come to mind first when one thinks of the library's holdings, they compose the first category to be discussed and, of them, this writer considers reference books the most important. Every library should have on its shelves some basic reference tools in science, the type and quantity depending on the usual factors of need and budget. These may include books ranging all the way from the finest and most expensive domestic tool in all the sciences--Chemical Abstracts (which can also be classed with periodicals or bibliographies)--to single dictionaries and handbooks. These tools have been reviewed thoroughly by Joseph C. Shipman,[8] supplemented with a classified list of titles discussed, each accompanied by purchase information. Because of this excellent summary, no better brief consideration of this subject can be recommended. It needs only to be updated by important reference items published since his paper was given at an Allerton Park Institute three years ago.

In their recent book on Building Library Collections, Mary D. Carter and W. J. Bonk[9] point out, that in an age of science, it is appropriate that the general collection of a public library contain books which explain to the lay reader the general nature of science and the scientific method, as well as central aspects of the various fields of science. These authors believe the two major problems are (1) keeping the collection up-to-date with new material or replacements of outmoded books and (2) the selection of sound popularizations of science done with accuracy and appeal in presentation. (Incidentally, Voltaire is said to have been responsible for interpreting Newton's discovery to the world. It is unfortunate that there is not greater recognition for books of this type today, for example, some kind of national award.) They report that a check was made of the tools used by public libraries to guide their buying in the field of cosmogony during the year when Russia put her first Sputnik into orbit and it seemed to the investigator that the librarian who wished to promote reading of material about the universe would not have been given substantial help by his selection tools. This finding takes us back to the question of selection which has previously been discussed but is one which certainly influences the building of the collection.

In a current article, L. Deuel[10] makes a plea for wide accessibility of scientific landmarks. He mentions a British collection, Bell's Classics of Scientific Method, begun in 1922, which shows great concern with interpreting scientific thought to the layman but states there is no comparable collection of master texts produced in the United States. He comments that "perhaps the distinctly American contribution of scientific reprint publishing lies in the so-called source books. A host of such anthologies (including an inevitable one on atomic energy) has done an excellent encyclopedic job in assembling selected short pieces to produce a smooth reader or a reference work on a special field." In the meantime one can acquire, as they appear, either republished singly or in collections, the classics for, as he says, no matter what advances are being made they will never be entirely superseded.

Margery Bedinger,[11] as Chief of the Science and Engineering Department of the Denver Public Library, wrote an excellent and practical article fifteen years ago reviewing what subjects to cover and what types of books to buy for use in the small library. The principles set forth are valid if followed today such as the yardsticks recommended applicable to the problem of obsolescence. The general types of science books are suggested for each of the Dewey classes. For example, her suggestions in regard to geology are typical of her analysis of needs:

> For the great out-of-doors is one's laboratory here and your local countryside will determine your choice of books. Again, as in the case of physics and chemistry, you will need elementary basic texts. You will also need the publications of the U.S. Geological Survey that deal specifically with your region, including the topographic maps and atlases. . . . But the books in geology that will delight your heart are the attractive popularizations. Both in the broad subdivisions and in more specialized topics there are good books for the layman, well illustrated. You will want to get all you can, but certainly if yours is a mountain region or one on the seaside, you will find your readers demanding the popular books that deal with volcanoes, caves, mountains, the ocean, whichever it is that they find near them. You will want a book on economic geology, of which there are a number to choose from.

She continues this category with a discussion of mineralogy.

When Alexander Marshack[12] undertook to write The World in Space he had the problem of making the full International Geophysical Year understandable and exciting. He told of making a check of library collections, both for youth and adult, finding no book had ever been written for the public explaining such difficult aspects of geophysics as geomagnetism and gravity. He said the subjects were taught rarely in universities yet these phenomena were central to an understanding of the IGY; they would be among the key branches of science in the age of satellites and space research. He solved his problem by making gravity and geomagnetism part of the story of the exploration and conquest of the earth, relating them to the advance of civilization, the problems of technology, and the drama of war. He says that this job of giving meaning and relevance to the new science of the day is the writer's hard task but an effort that will fall equally to the librarian and the teacher.

This same author also said: "We never argued about the facts in a textbook. Like medicine, they were simply taken.... I remember not one chemical law or formula and hardly a handful of dates in European history. But I know the psychology that the lion uses in hunting and the reason deep-sea divers get the bends." He feels that books should have an emotional appeal and that the library is the open school of the mind where one can browse and learn with a sense of excitement. For example, it was only after he experienced the drama of test tubes, epidemics, and bravery of the scientist in books such as Microbe Hunters, Arrowsmith, Men in White, and Yellow Jack that he went into biology classes to learn and to question. This is in contrast with the statement made in one of the earlier papers that motivation for a career in science does not come from reading.

A new twist in stimulating high school interests in science are the Traveling High School Science Library, initiated in 1955, which provided an experimental collection of two hundred books to approximately 1,700 high schools in 1959-60, and the Traveling Elementary School Science Library, which operated for the first time this past school year by providing a collection of 160 books for eight hundred schools. The Foreword of the descriptive booklet[13] states that "an actual statistical study of the collections in nearly 1,000 libraries of high schools that participated in the program in 1958-59 disclosed that on the average only 5.2 per cent of the books available were in the sciences and mathematics." The recommendation is made that not less than 20 per cent should deal with these subjects. These programs have been instituted by the American Association for Advancement of Science and the books are loaned for one year

on a rotating arrangement. From this group a librarian can make a listing of the more popular books and purchase copies for the library's permanent collection. Although not eligible to participate in the program, public librarians, in surveying their own collections, can use the A.A.A.S. annotated classified science book list, which is a basic guide to reference books and to recreational and collateral reading with one hundred books marked with a double asterisk to indicate their indispensability. Many of the books were selected because of their potential interest to the general reader who has a limited background in the sciences.

Nolan Lushington,[14] in his analysis of selection aids for science books, concludes there is a great lack of books intended to interest the high school student without either writing down to him or presenting basically non-scientific or biographical material which, although interesting and perhaps inspiring, teaches little about the nature of science. From an examination of the A.A.A.S. list, previously mentioned, the author states it may be inferred that most of the titles intended for the junior reader are not as useful for high school students as are the popularly written books intended for the intelligent layman. If this situation continues, he feels the lack of books for a particular age group may constitute a gap in libraries of all types.

G. O. Blough[15] sounds a more encouraging note when he states that "each year more school systems are improving their offerings in science for children." He also feels that publishers are giving serious consideration to needs. Children find much satisfactory information in such books as Gallant's Exploring Mars; Hyde's Atoms Today and Tomorrow; and Benedick's Electronics for Young People. Their use of books sometimes calls for an unusual approach such as the "Show-Share-Do-and-Tell" period in schools. For example, two cocoons produced by a fourth grader raised interesting questions which called for Hussey and Pessino's Collecting Cocoons while the emerging moths led to other titles.

As an introduction to building the science collection, the A.A.A.S. distributed a reprint of an article by the Coordinator of Young Adult Services of the New York Public Library[16] in which she discusses the budget, book selection, physical facilities, services, the young adult, and finally the librarian of whom she says: "We start with ourselves...because we know we must be, so far as possible, well-rounded human beings with standards and values we can express and with patience and courtesy toward all points of view. We know we must encourage discussion by young adults of their likes and dislikes; we must

encourage the development of such judgment that they may make their own best choices among books, people, and ideas." In the small one-man operation, she recognized that the librarian works with all ages but has a special understanding of the differences in the young adult and does not expect too much of them too soon.

Before leaving the category of books, paperbounds must not be dismissed lightly. Even though they are expendable, budget advantages are obvious. If you missed A. L. A. 's Top of the News for December 1957 but wish to experiment, this issue contains a good discussion by two public and two high school librarians. While paperbounds may need to be replaced more often then clothbound books--that is, if circulated--the problem of obsolescence helps to take care of itself. The Scientific American series will serve as one example of what is available in the science fields. Probably the most carefully selected list of science paperbounds is the 1960 list issued for A. A. A. S.[17] containing over five hundred titles representing sixty-five publishers. It contains reprints of popular trade books, some out of print in the cloth edition and others still in print, reprints of classics long unavailable in any edition, and books prepared especially for the trade. The number increases annually. All of the major basic sciences are represented and, among the applied sciences, medicine and engineering. Technicians' handbooks and books for the amateur hobbyist are excluded. A brief descriptive note for each book and the classification of each title as to degree of difficulty will assist the prospective reader or purchaser.

Government Documents

A potentially large category of materials for libraries are those issued by federal, state, and local governments as well as by an increasing number of international agencies. They follow a broad spectrum of subject matter and appear in many forms ranging from books and periodicals to pamphlets and pictures; hence precede the discussion of nonbook materials. The majority of these publications can be classed as reference material and a large proportion is concerned with science, such as "A Selected Bibliography of Research and Development and Its Impact on the Economy," issued in 1958 by the National Science Foundation. On the other hand, many of the publications are intended for popular use such as the yearbooks of the U.S. Department of Agriculture which are in reality monographs on subjects in demand such as "Soil," "Crops," "Gardening," "Insects," and "Plant Diseases." Many of these titles are free or

sold at extremely low prices so it is not low book budgets which account for their absence on the shelves of nondepository libraries; it is probably due to lack of vision in seeing how they supplement the library's holdings or lack of time in which to check various listings, order documents, and care for them.

Periodicals

Every serious worker in the sciences knows the importance of periodicals as the best authentic source of new discoveries and developments. He turns to them first for information. As a specialist he is likely to have a personal subscription to at least one authoritative journal in his own field--one which publishes original articles and possibly brief abstracts of some appearing in other journals as well as news notes. If the scientist is a chemist he receives Chemical and Engineering News with his membership in the American Chemical Society which keeps him abreast of developments in chemistry, both pure and applied, although he turns to other journals for original articles. Subscriptions to scientific journals are expensive when compared to the cost of popular magazines. Nor are they requested as often as the latter. Furthermore the articles appearing in professional journals are written primarily for other scientists rather than for the laity. Therefore, the small public library is in no position to branch out into special fields unless particular community conditions warrant it; otherwise it should limit itself to the usual science area periodicals indexed in Reader's Guide. The availability of Wilson's Science and Technology Index is important whether or not the periodicals are in the library.

Such an exception has been noted in a library which serves the population of an industrial community. The industries there are based on the physical rather than the chemical sciences so the library receives calls from individual engineers and physicists as well as from the local industries for original journal articles and its holdings are strong in the areas needed. There is also a technical college in the community whose students and faculty members make frequent use of the public library. The latter takes great pride in having adapted its policies to fit this local situation and has purchased periodicals and other materials, as well as employed staff, to serve these special needs.

In the large college or university the situation is usually different, especially if research is in progress; hence periodicals are available both for current and future use, for the student, as general reader of today, may be the specialist of to-

morrow. A scientist may come to the public library for general reading material and he may need information in a field unrelated to his own. If his needs cannot be met within the library's holdings, there is always the possibility of suggesting interlibrary loan or the purchase of a copy duplicated by microfilm or photoprint. In any event, periodical literature should not be neglected as a source of information; librarians should be alert to it and not afraid of it.

In a paper condensed from a thesis, D.C. Orlich[18] a teacher in the Butte, Montana, Junior High School, concludes it is possible to include the library in the science program with more work and planning and little money. He queried one science teacher from each of the 195 public and private high schools in the state on the number of science-related books in the school library, finding that at least 28 per cent were inadequately stocked. Their top ten periodicals were listed, with the per cent subscribing ranging from 17-80 per cent. He comments: "An interesting side light was that, with all the fuss and commotion over space, no high school reported taking Sky and Telescope." Short accounts of current science events in the periodic Science Supplement of My Weekly Reader (American Education Publications, Columbus, Ohio), have become helpful in teaching science to younger children who are stimulated to read more, ask more, and to experiment for themselves. Science News Letter has proved itself a useful reporting medium for any type of library or individual.

A great many industries, depending on science for their progress, publish and distribute periodicals which not only are designed to promote their products in an unobtrusive manner, but contain articles of general scientific interest. This type of periodical literature is referred to as a house organ and lists of them are available. The articles are, as a rule, authoritative in content, often accompanied by bibliographies, and particularly well illustrated. Not many libraries can afford to give shelf space indefinitely to this type of literature but they may find it quite worth-while to be placed on the mailing list for some titles. Issues which are monographic in type may prove to be the best brief review of a scientific discovery, hence grist for the subject file.

Nonbook materials

In wondering how much emphasis one dared place on other nonbook materials, the author visited an elaborate materials center occupying the most strategic location in a new city high school. Then, in the September, 1960, issue of

Illinois Libraries, K. I. Taylor[19] described West Leyden's Center for Instructional Materials, illustrated with pictures of the Browsing Room, the Contemporary Life Reading Room, Man's Heritage Room, Investigation and Invention Reading Room, and Records of the Past Reading Room. There no longer was any doubt that nonbook materials are a part of the life of today's student and therefore, in the future, we must not plan solely for a book-oriented clientele. In this connection one cannot help but wonder if libraries will be called information centers. In the present discussion little space can be given to each of the various forms of nonbook materials. A recent book by D. Mason[20] attempts to bring together discussions and references on many types. Eleanor Fair[21] has written Chapter 8 of the Handbook of Medical Library Practice in which she describes the handling of miscellany of various sorts and includes an excellent list of sources.

Pamphlets

The pamphlet collection affords the means of keeping abreast of science material (1) sometimes before it is available in book form; (2) occasionally because a pamphlet is the only source of information; (3) often because some subjects can be covered by free and/or inexpensive, material at a time when the budget cannot be stretched; and (4) rarely when one wants to have "more and more about less and less." Although one would not lay claim to this last as a library objective, actually pamphlets fill a need in many cases where the general reader seeks specific information more quickly than if he tried to find it buried in a book or failed to understand it if indeed it could be found. In any library the pamphlet collection is a reservoir of current material limited in its potential by the time element available for weeding, checking sources, and acquiring material.

Bibliographies

In rounding out the science collection, bibliographies are indispensable even though the reader may need some guidance in their use. First of all, study of a bibliography may suggest the use of material in the library and, as such, it becomes a key to what might otherwise be overlooked in sources not obbious from a mere scanning of titles in the card catalog or upon the shelves. Bibliographies are particularly useful in supplementing the library's holdings; they suggest material which can be borrowed for the reader or perhaps items he will want to purchase for himself. The bibliography of science books pub-

lished by the New York Public Library should be in every collection. Business and Technology Sources, the bulletin of the Business and Technology Department of the Cleveland Public Library, is an excellent source of bibliographies on special subjects. Each issue serves as a checklist for the librarian and contains brief annotations and buying information for books, special reports, and documents.

Among the many other useful types of bibliographies, in addition to those appearing in encyclopedias and other reference books, are those appearing in periodicals or in booklets, and which cover a single subject or subject area. Two important ones that come to mind are those on earth satellites, guided missiles, rockets and space flight by Mildred Benton.[22, 23] Librarians probably have preserved these because of their current interest. But what of topics representing new fields of endeavor not yet covered by bibliographies such as energy conversion which is receiving a good deal of attention now? Librarians should be on the alert for these if and when they do appear.

Reports

A new form of scientific and technical literature arose during World War II--that of the so-called "Reports." Our industrial laboratories, universities, and research institutions publish these reports of work done, generally on contract with governmental agencies, and they number an estimated 100,000 each year. Nonclassified reports contain what was once restricted and confidential information often available in only one copy. They are now taking their place along with the older conventional forms of science literature available for research. This form of literature grew haphazardly with no centralized coordination; hence it has been both confusing and frustrating to the librarian as well as to the user. Little was known about its acquisition so several methods of retrieval are necessary to acquire and use it. Reports are not intended for general reading so fortunately do not present a problem to many libraries. In addition to the unclassified reports some libraries act as depositories for classified information where facilities are provided for searching by those persons who obtain clearance as determined by their "need to know." D. R. Pfoutz[24] has recently presented a guide to their use and briefly discussed their permanent reference value.

Patents

Patent literature is another vital tool for research which does not come within the category of materials necessary for

the general reader although information on patents is probably requested more often than on reports. Some of our largest libraries are depositories for copies of U.S. Patents but, as a rule, the inventor employs a patent attorney to have a search made for what is termed "prior art." All libraries may want copies of a new pamphlet, Patents and Inventions, an Information Aid for Inventors, compiled by the U.S. Patent Office to give to those asking how to go about securing a patent. This twenty-five page booklet is addressed to the independent inventor. So eager is the Patent Office for its wide distribution in the interest of saving heartaches and headaches that they may be purchased from the Superintendent of Documents at $11.25 per hundred or 15 cents each.

Manuscripts

E. B. Barnes[25] points out that a university library is limited no less than other types of libraries by the interests of the group it serves and by the support it receives. He says:

> The resources of manuscript and printed materials needed by the students of a university are, and must be, without end. Scholarship represents the accumulated store of the past, and each student must have recourse to his particular segment of that store. There is no substitute for the actual presence of needed books and serials in the library. Interlibrary loans represent a form of charity that can be used only sparingly. Microfilm copies are troublesome to use and cannot be considered more than poor imitations of the actual titles. An extensive use of either of these mediums implies that the students should go elsewhere to do their work. All the services which a library can offer are of little importance if the resources are not present....

Original manuscripts in the form of doctoral dissertations and master's theses are an important part of scholarly scientific literature. However, libraries may also acquire some results of research listed in Library Research in Progress solely for their professional collections. It is not likely that manuscripts will form an integral part of the science collection intended for the general reader in any type of library, however necessary they may be in a university library. Many of these are eventually published and may then find a wider audience than that for which they were originally designed.

Trade Catalogs and Other Materials

Many other forms of nonbook materials may come to mind in reviewing this list. Obviously every type cannot be included but the publications of trade associations and other organizations supported by industry are worth investigating. For example, Facts About Pharmacy and Pharmaceuticals, published by the Health News Institute located in New York City, gives a comprehensive picture of pharmacy and pharmaceutical manufacturing. Trade catalogs are useful tools too for the general reader who knows they are available. To illustrate, the Denoyer-Geppert catalog listing supplies of biological specimens and anatomical charts, is informative as well as useful. A search of library literature revealed no report of studies made of the relative use by the general readers of the various categories of materials in the science collection. Such information would be pertinent to this discussion.

Audio-Visual Materials

The materials so far discussed, even those not thought of as traditional library materials, are products of the press--they are in print or near-print form. Less than one generation has made new types of materials available--so much so that some libraries have added professional staff members to handle them. It was with hesitancy that this subject was considered applicable to the smaller library but an examination of the 1959 report of Indiana's 246 public libraries,[26] half of which are in communities of less than 5,000 population, dispelled any notion that libraries could not or did not have audio-visual equipment. More than half of the 246 libraries had such items as motion picture projectors, screens, slide or filmstrip projectors, record players, tape recorders, microfilm readers, and other equipment to use the materials in their collections. The attendance at film showings was reported as over one million persons and the total circulation of audio-visual materials as 475,540 items.

Recordings

There has been a tremendous increase in the production of nonmusical recordings during the past decade although science as a subject for recording is decidedly in the minority. There are several record reviewing magazines and several periodicals, such as The Saturday Review, which include reviews of nonmusical records. Library Journal includes reviews written by specialists for the librarians' consideration and from the library's point of view; thus there is no lack of ways to learn of

their availability. It remains the task of the librarian to seize the various opportunities to tie in recordings with books on science and other components of the collection and to handle imaginatively these new tools which help to interpret developments to groups as well as to individuals. Two of these, for example, might be Edward Teller's recordings of The Theory of Relativity and The Size and Nature of the Universe.

Films and Filmstrips

In the recently adopted standards for school libraries[27] one reads:

> Films and filmstrips are without peer for conveying many types of information and creative expressions. Although a school may rent or borrow many films, it will still need to own some films. This principle of ownership applies to filmstrips in even greater degree, since the costs involved are not so high. Effective use of these materials is made in the classroom and also in the library or audio-visual center, where individual students have the opportunity to make independent use of films and filmstrips in their preparation of assignments or for other worthwhile purposes...

Offerings of free films put out by the public relations departments of modern industry range from trips to Williamsburg, Virginia, and dramas from Our American Heritage television series (without the commercials) to how to grow a more luxurious lawn. A recent addition to the library is a series of career reports for senior high school classes. These, of course, are a supplement to the components of the collection rather than a permanent addition to it because they are obtained on loan.

Realia

In the Standards for the School Library Programs mentioned above, this author was introduced to the term realia used to cover such materials as three-dimensional objects, museum materials, dioramas, models, and samples. Such objects represent a unique and vital source of information and appreciation for students as well as being primary sources for teaching and learning. Such equipment in colleges probably is retained in individual departments where it is used. Public libraries will have this type of material only if their policies dictate its acquisition.

Pictures and Prints

One of the most useful and economical types of audio-visual materials are the vertical files of prints and pictures of people, of objects, of scenes, and of events, classified by subject matter. The general reader often makes use of these for talks, for displays, or for illustrating, provided he knows of their existence. It is not generally realized how much is available in the field of pure and applied science. Many firms, either individually or through their trade associations, are only too glad of an opportunity to furnish booklets, illustrations, and sometimes films which deal with products but emphasize the educational factors involved. The school librarian has the added advantage of working closely with the instructor in acquiring and planning specificially for displays of books and other materials relating to a central theme in conjunction with classroom instruction. Pictures may also prove helpful to the student in planning exhibits at science fairs.

Services of libraries per se are without the scope of this discussion but the component of one science collection leads to mention of a service which has much significance in the community where it is located. A union list of the holdings of scientific and technical periodicals in the libraries of the area has been maintained for the past decade by a committee of special librarians working with the Head of the Science and Technology Department of the Indianapolis Public Library. Questions as to where specific periodicals can be located in the area covered by members of the Indiana Chapter of the Special Libraries Association are answered by the librarian in charge of the Science and Technology Department since the file is permanently housed in the Public Library.

Related to this question of interlibrary cooperation is one of seeking help from special librarians on questions pertinent to their own areas of interest. In fact, a great deal remains to be done in articulating relationships between special and public libraries, even with college libraries to a lesser degree. To be sure, the special librarian has no time to fill the request of a student who asks for "everything about antibiotics" --truly a large order. Suppose a more modest request comes from a public library, the chances are good that the special librarian will make every effort to send usable material which can be added to the public library's vertical file--so glad is he to repay the favor of loans made to him by the public library upon whom he leans heavily for borrowed items.

More and more students now going through high school and college, with many of them choosing careers in science, will create a market for science literature that will expand tremendously in coming years. Librarians must be prepared to meet their share of this demand. There will be no dearth of problems which will challenge them such as availability of titles, budgets, physical facilities, adequate selection aids, availability of books on approval, personnel with science backgrounds, and ways and means to publicize their holdings--all of which influence the components of the collection. C.P. Snow[28] speaks of the great no man's land between two cultural groups--the intellectual and the scientific. The gap must be closed if we are to survive, he says.

But when all is said and done, the fact remains that the clientele of any type of library has a right of easy access to as adequate a collection of science literature as the library can afford.

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