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Special Libraries, March 1972

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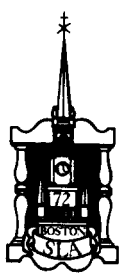
March 1972, vol. 63, no. 3



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March 1972

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January 1972

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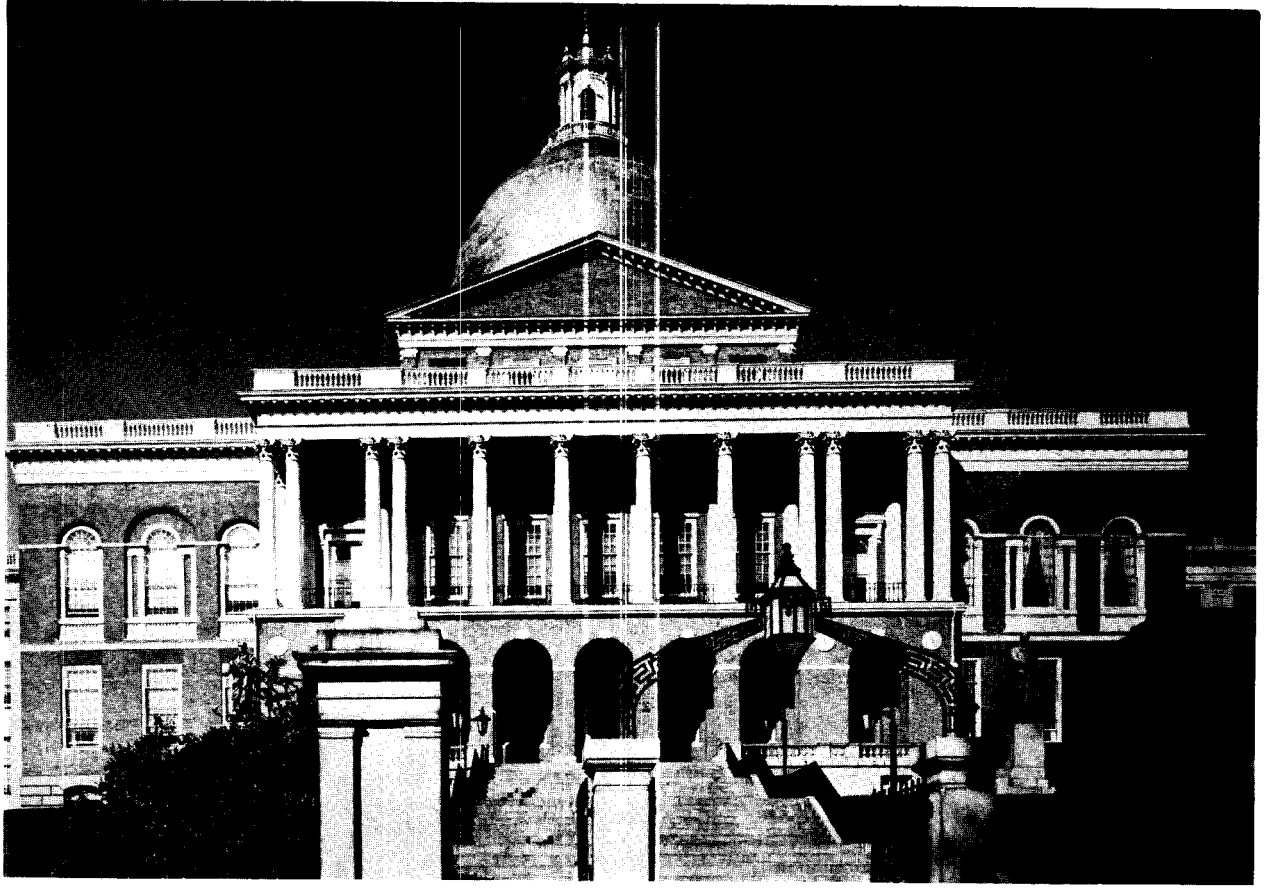

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The New York Times Information Bank

John Rothman

The New York Times, New York, N.Y. 10036

■ *The New York Times* Information Bank is described in detail. Scheduled to be in operation in 1972, this project makes available abstracts of newspaper articles for on-line search and retrieval, combined with microform copies of the original articles.

LIKE most other newspapers, the basic information resource used by *The New York Times* news and editorial staff has been the clipping morgue. The collection goes back about sixty years and covers—aside from material from the various editions of the Times—between 60 and 70 other publications, from which material is clipped selectively as our news and editorial staff requires for background information.

Between 11,000 and 14,000 clippings are filed per week. The morgue now contains about 20 million clippings. Many of those are, of course, duplicates. In the usual fashion, when a story cuts across three or four different subject headings and four or five different names, we clip as many copies as are required to put one copy of the clipping in each of the relevant files. Indexing in the morgue is done very rapidly by people with much experience but very little formal training. At times it is haphazard, and not always as consistent or as accurate as it should be.

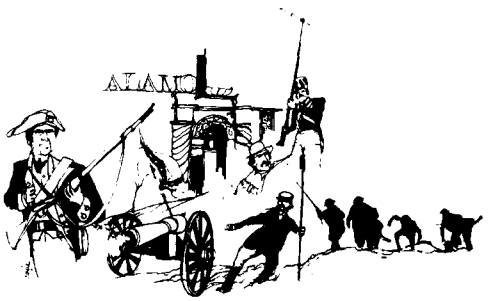
Also, in an operation of such a magnitude, there is no way to exercise any real control over the work of the indexers. A clipping is marked and filed. There is no way of checking whether that clipping has actually been filed in the right place. The effort to check this would require as many man-hours as it does to get it in there in the first place.

The second problem is that once the clipping is in the file, there is no guarantee that it will remain there. People remove clippings and want to use them at home or duplicate them, and then do not return them to the right file. Sometimes whole files disappear. Occasionally, a busy reporter who wants to check two or three clipping files at one time will spread them out on his desk until there are no longer separate files, but rather one large jumble.

Space is always a problem; so, the more clippings are processed, the more they are jammed into folders and the more quickly they deteriorate and become crumpled, torn and illegible.

Finally, even if the clipping is in the folder in which it belongs, even if it remains there in legible shape and in its proper chronological order, there is one basic problem with a clipping morgue. A file can be retrieved through *only one* subject, and if a searcher is interested in, for example, **Airplane crashes, California,** and **Marine Corps,** he can look under *either* **Airplanes** *or* **Marine Corps** *or* **California,** and it will be in *each* of those folders, along with all other material that is relevant to *one* of these terms.

The principle is undeniable. It always holds when dealing with a document file rather than a truly indexed file. The document is only in one place, and it can be retrieved through only one access point. One cannot coordinate several index terms to reach the precise material. That is a basic defect in a clipping file, and that is one principal reason why the Times undertook to construct the Information Bank. Following is a description of the method employed in the Bank's operation.



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Input Procedures

One copy of each clipping that would have been included in the Index and that would have been processed into the morgue, along with its run-overs, is pasted onto a sheet of paper, the top of which is marked with the year and a number. That number indicates the frame, on a 99-frame microfiche, where that clipping will now reside. In other words, the paste-up becomes one of 99 frames on a microfiche. This particular microfiche format was chosen because experience has shown that all the clippings from one week-day issue of *The New York Times* will fit on one such fiche. For the Sunday edition, four are needed.

The original paste-up now goes to MCA (Microfilming Corporation of America) where the microfiche is prepared. Copies are passed along to the indexers, the same people who are working on *The New York Times* Index.

The indexers sit at video terminals and prepare, directly on the terminal, abstracts of each clipping that they index, along with the date-page-column citation, the microfiche number (which they take from the top of the frame), and whatever index terms they know are required to properly index each item. They do this for *The New York Times* material as well as for the selected material from those 60 to 70 other publications that are processed. The Index Department has 26 such terminals and 28 more are scattered throughout the building for use by inquirers.

The abstracts themselves are then stored in an IBM 360/40 computer. The original microfiche are stored at the Times in a microfiche storage device which can store up to 50,000 microfiche. It consists of a large carousel that holds 500 cartridges, each cartridge holding 100 fiche. In this case 50,000 fiche means about 40 years' worth of material: 6 fiche for the week-day Times, 4 fiche a week for the Sunday Times, and about 15 fiche a week for the material from the other publications—25 fiche a week. Storing 50,000 fiche is enough for 2,000 weeks, or close to 40 years' worth of material.

Information on Display

The storage device operates under computer control. When a user at a terminal has scanned the abstracts that are relevant to his particular inquiry, and if he now wants to see the clipping for a given abstract that has just been displayed, he pushes one button on the keyboard. That sends a signal to the device to select the right cartridge from the carousel, position the cartridge in such a way that the appropriate fiche can drop out and get caught on a platen by an xy coordinate system. It is placed so that the right frame is in front of the lens of one of four built-in television cameras, and the camera then projects the image onto the same screen from which the request originated. If there is no competition for the camera, it takes about eleven seconds from the time that the user hits the button that says "Show

me the fiche," until the image appears on the screen. When the image appears on the screen, he sees the entire frame. At that point he cannot read the fine print, but he can easily read the headlines and determine which section of the paste-up he wishes to read. There is a little button next to the terminal with which he can scan the entire frame to come in on the particular area that he wants to read. He has a lever by which he can zoom in the camera lens and enlarge the text to the point where it is easily legible. The specifications required that it must be possible to display legibly on the screen a story two to three columns wide and about 30 to 40 lines deep. That has been accomplished.

This is probably one of the most intriguing and innovative parts of the system: the combination of full-text display with searching of the large file by computer and sophisticated concept coordination techniques.

That part of the system, of course, is for in-house use only. It is a closed-circuit television system and right now the maximum technical and economic conditions under which the fiche can be projected is 2,000 feet. Therefore, the microfiche device—the entire full-text display system—is for in-house use only.

Outside customers will be able to get all the abstracts, of course, directly over whatever terminal they acquire. They will receive, as an optional part of their subscription, duplicate sets of microfiche (but of *The New York Times* material only, because we do not own copyright to the non-Times material; however, we hope eventually to make some arrangements with the other publishers for the full text).

We do distribute the abstracts to non-Times as well as Times material. Thus, the customers will receive microfiche sets of *The New York Times* material, along with a microfiche reader/printer. The outside customer must take a manual step: After he sees the abstracts on the screen, if he wants the corresponding full text, he must go or send somebody to pull the right fiche out of the files by number. It will not require any searching, merely a numerical look-up. We have asked publishers for permission to do that, and almost all of them have readily granted permission.

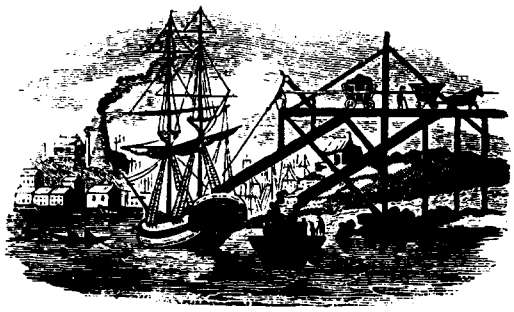
Additional Features

That, in very brief, is how the system will operate. Techniques have been incorporated in the search procedures to enable people to get the material out quickly, readily and without having to be indexers, systems engineers or librarians themselves. The system is oriented towards the Times's reporters and editors. The philosophy is that our own staff is likely to be more demanding because they operate with difficult deadlines, and they will be comparing the way the new system works with the way the old system has worked. The clipping morgue was not available to outsiders, so outsiders compare, at best, how the Information Bank works against use of the Times Index and the Times on microfilm.

Built into the system is a thesaurus whereby the system will automatically match index terms, automatically display cross references and scope notes, and provide advice to the people who are doing the searching.

Also built into the system are techniques for narrowing or widening a search that do not depend on index terms at all. For example, the date can become very important. Someone can say "I want material on accidents," and look for everything from airplane accidents to sleigh riding accidents, if he wants. He doesn't have to include any other terms, but if he knows approximately what period he is interested in—suppose he wants all the material on accidents from March 15 to March 29—he can narrow his search sufficiently so that he does not get overwhelmed with the amount of material.

He can limit material by source; for example, if he wants all *New York Times* material that came from AP or UPI or Reuters. He can limit material by byline or by type of material. For example, one of the searches that had to be answered



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in the morgue, which could be done only with great difficulty, was to provide a survey of letters to the editor about the draft. The morgue could provide the folders on the draft, but the letters to the editor were mixed up with all other kinds of material; thus it was very difficult to retrieve such material. With the new system, a simple request—"I want material about the draft; I only want letters to the editor"—is sufficient. The requester sets the type-of-material indicator to "letters to the editor," and he will get only those. Of course, he can do that for surveys, news analysis pieces, editorials, etc.

He can ask for material that is accompanied by specific illustrations, if he wants them. For instance, suppose somebody wants the battle maps of Vietnam that have been published in the press. He can ask for Vietnam and set the graphics indicator to maps, and then he will get only that material which was published accompanied by maps.

These are a few of the methods employed to make the search easier and, in a sense, independent of the index terms.

The File

Material has been processed into the file since December 1, 1971, and as soon as the system is fully operative, some demonstrations of the service will be undertaken. The initial data base will include all *The New York Times* material starting with December 1, 1971.

The Times Index has been produced with computer assistance since 1968. Doing this provided an opportunity to determine whether this kind of material could be processed effectively by computer. It seems to have been proven. It also provided material in machine-readable form. It needs some editing to be able to get it into the Information Bank system, however. That part of the process is well under way, and it is expected that all material for 1969, 1970 and 1971 will be in the file by the fall of 1972, with 1968 to follow.

It is expected that by the end of 1972 the complete file—both Times and non-Times—should be up to date, with Times material retrospective to 1968. The next project is to go back to the material that is now in the clipping morgue, which goes back, in some cases, to the beginning of the century. This process is expected to take between five and ten years, in part because of the poor shape of the back files. However, within five years—perhaps by 1975/76—we should be through the most important material there and have better than half of the total bulk of the morgue absorbed. It will probably take another five years after that to finish the rest.

Experience with the Times's own users and user surveys taken both in-house and out-of-house indicate, however, that approximately 85% of all inquiries deal with material less than five years old. Thus, by the mid-seventies the data base ought to satisfy the overwhelming majority of requests.

Then What?

What is in store for the future? Indications are that if the system is successful the Times will be asked to greatly expand the data base. There may be a number of publications that will want to be part of the Times Information Bank and that will be processed either by the owners or the publishers doing the indexing themselves, using the Times's software, or by their contracting with the Times in some manner to do this.

The next step after that is to get into picture processing. Picture indexing is a

far more difficult art than text processing, and now it is far more primitive. Much less is known about how to properly index, store and retrieve pictures than about how to handle text. The Times has a fair-sized photo library—about two million prints. The development of a picture processing system may possibly be done in cooperation with some other large picture collection.

The Times maintains a fairly good collection of reference materials for the use of newspaper people—about 45,000 volumes, 600 serial titles, etc. It is hoped that at least the catalog to this collection will be processed into the file. Therefore, at some point in the not too distant future it will be possible to put a question into the computer over the terminals, process it directly, and retrieve abstracts, citations, full text and full-text references, pictures, graphic material of various types, and background references to related materials on our library shelves. This is what the Times set out to do, about six years ago. Much work has gone into this system so far, and I would say that right now we are on the verge of passing a major milestone.

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John Rothman is director, Library and Information Services, *The New York Times,* New York.

Conservation of Drawings and Prints

Antoinette King

The Museum of Modern Art, New York, N.Y. 10019

■ Some of the basic techniques of preserving and restoring prints and drawings are outlined. Examination, dry cleaning, stain removal, mending, backing removal, and lining are discussed, as well as aspects of the complexity of bleaching, types and nature of some stains and discolorations, and materials of poor quality used by many framers.

IT IS IMPORTANT to know as much as possible about the kind of care the prints, posters, documents and drawings in your collections will receive when sent to a conservator. Most conservation treatments, however routine they may appear at first glance, vary widely. Each picture has its own problems and requires variations in handling, the knowledge of which is gained only with training and experience.

When a picture is first sent to a conservation laboratory for treatment, it is carefully examined to determine the exact materials used by the artist and the nature of damage and deterioration. For example, the character of the surface can be determined in raking light, thin spots and old repairs can be seen in transmitted light, media and surface accretions can be studied with a microscope. Some determination of the acidity or alkalinity of the paper can be made with the surface electrode of a pH meter. Everything about the picture is noted in a condition report and photographs are taken of the picture before any treatment is undertaken.

Treatment Begins

The first step is usually dry cleaning. If as much dirt as possible is not removed first, any succeeding treatment involving water or solvents may drive the dirt into the paper, resulting in a stain. Particles of dirt penetrate the paper with a cutting effect that mechanically weakens it. In time they become firmly embedded in the paper and cannot be removed.

Loose dirt is lightly dusted off with soft-haired brushes. Superficial dirt can also be cleaned off delicate surfaces with an Opaline Dry Cleaning pad, which is a mesh bag containing soap eraser dust. Erasers such as kneaded, Pink Pearl and others are used for more deeply ingrained dirt. Most Western papers can be safely cleaned with these methods. However, any dry cleaning process should be constantly checked in a raking light to be sure the paper fibers are not being pulled up or disturbed in any way. If the medium of the picture is delicate and friable, such as pencil, charcoal or watercolor, it cannot be dry cleaned. Very soft fibrous papers, such as Japanese mulberry papers, or heavily coated papers will be rubbed up in such a process and cannot be cleaned.

Stain Removal

The removal of stains is usually the next step. There are a vast number of different types of stains on pictures (coffee, oil, grease, water, flies, tapes, cardboard, etc.), but their treatment falls into two general categories—those taken out with solvents and those taken out with bleaches. As the subject of solvents is vast, I will only discuss taking out

stains from Scotch tape and masking tape (Figure 1). These are among the most common and difficult of stains.

When some Scotch tapes are old they become very brittle. Their adhesive exudes into the paper and the tape itself can be lifted off the paper with the edge of a scalpel. If the Scotch tape or masking tape is strongly adhered it is taken off the paper by flowing a mixture of toluene and hexane under an edge of the tape with a fine brush. The tape is then lifted bit by bit with tweezers as the solvent continues to be brushed under. When the tape is off the remaining adhesive is rolled off with swabs dipped in the toluene-hexane mixture or in acetone. The deep brown stains these tapes often leave in paper are difficult and sometimes impossible to remove. Sometimes rolling over the area of the stain with cotton swabs soaked in acetone and pressing with blotters is enough. Often stronger solvents have to be used such as carbon tetrachloride or pyridine, washed out with other solvents. Any yellow left can then be bleached. This is often a time-consuming process because the stain must be gone over many times before it disappears or is reduced.

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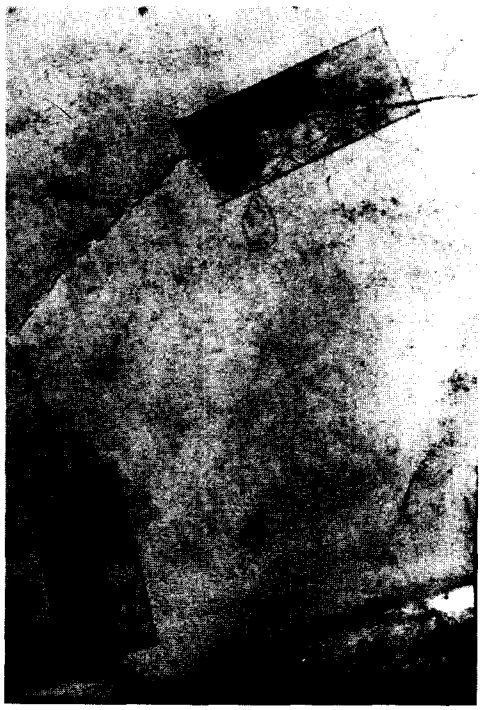
Figure 1. Stains from Adhesive Tapes



Bleaching

Bleaching is one of the most controversial areas of paper conservation. Although much work is being done throughout the world on the action of various bleaches on paper, there is still substantial disagreement about some aspects. The findings of workers in France do not agree with the testing by people in Leningrad, for instance. Also, many factors remain relatively unexplored. For example, what is the exact action of various bleaches on sizing and fillers in the paper, and the various drawing and printing media?

The methods discussed here are those representing the greatest consensus at this time. The bleach most commonly used by most conservators in the U.S. is Cloramine-T. Its action is very mild and does not whiten the paper beyond its original color. Also it does not bleach most colors, although there are exceptions. One exception is cadmium red. Chloramine-T is the only bleach we know of now that *is* safe to use with most colors. Therefore it is used to bleach stains on watercolors. Another bleach that is beginning to come into wider use is chlorine dioxide. It is much stronger and faster acting than Chloramine-T and removes more resistant stains. However, it cannot be used on colors or papers containing ground-wood. Also, it is very toxic with a penetrating odor and must be used under a fume hood. There are other bleaches such as hydrogen peroxide and sodium chlorite which are used in varying circumstances.

There are several important types of damage treated by bleaching:

1. *Mold stains.* Mold spores are present everywhere, but they do not become active until the relative humidity goes above 70%. Then you can have a sudden and severe attack of mold on paper objects. The decomposition of the fungus

leaves a stain. This is why it is imperative that relative humidity be kept at about 50% ± 10%. If the relative humidity is below 30% for long periods of time paper loses necessary moisture irretrievably and is embrittled.

2. *Water stains.* This is another reason for the necessity of controlling temperature and humidity. When the relative humidity becomes dangerously high, moisture collects and can result in waterstains on paper.

3. *Discoloration from light.* The photochemical action of light on paper, particularly ground wood-pulp (newsprint), is one of the main causes of its embrittlement and consequent discoloration.

4. *Discolorations from poor quality acid wood-pulp matboard.* The acids present in ground wood-pulp cardboard act on the paper and weaken it by causing breaks in the cellulose chains making up the paper fibers, with consequent discoloration. Along with acids there are many impurities in these boards, some in the form of water soluble dyes, which also migrate and stain.

There are two main categories of bleaching: 1) local bleaching, the application of bleach on cotton swabs or a brush just in the area of the stain; and 2) bleaching the whole object in a tray.

Local bleaching is done if the stain is relatively small or is on a picture done in water soluble media such as a hand-colored lithograph, a print done in a modern ink containing dyes or an unfixed charcoal drawing. A mild solution of the chosen bleach is dabbed on the stain and allowed to dry (Figure 2). This is repeated if necessary until the spot is almost gone. The area is then flooded with water and blotted to wash out as much of the bleach as possible. The first wash reactivates the bleach for a moment, removing the last of the stain.

Bleaching stains in a bath is the most satisfactory method. It is the only really satisfactory way to remove the large, overall stains caused by light or a backing board of poor quality. The stain is bleached evenly and all at once. The bleach can be washed out by running water after the stain has been removed.

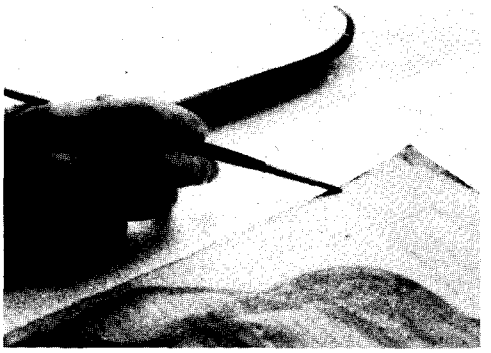


Figure 2. Bleach Dabbed onto Stain

The chosen bleach, usually Chloramine-T, is dissolved in water to fill a pan somewhat larger than the object to be bleached. The strength of the bleach varies with the severity of the stain and the type of bleach used, but is usually between a 2% and 4% solution.

The Bleaching Method

The picture is first immersed in a bath of water. There are two reasons for this. First, it is best to have the paper evenly wet before it is put in the bleach bath. It always takes a moment or two to get the paper completely wetted. If it were in the bleach bath first it might bleach unevenly because of one part of the paper being immersed before another. Second, often some of the components of the discoloration in the paper are simply water soluble. Therefore, they come right out in the water, turning it yellow. All this should be washed away in several changes of water, if necessary, until the bath is clear. A small amount of acid is washed away in these baths and the paper is thereby strengthened. When the paper is wet and the water of the bath remains clear the drawing is placed in the bleach bath. A sheet of glass or plastic is put in the bottom of the tray to support the drawing, which is always lifted with the glass or plastic under it. The length of time it remains in this bath depends on the stain and the type of bleach. The drawing is then washed in

running water for the length of time it takes to remove all trace of bleach.

When the picture has been thoroughly washed it is lifted out of the bath and placed on a blotter. The glass or plastic is gently lifted off. If the picture is on one flat plane, such as lithograph, it is put between fresh blotters and weighted with plate glass so that it will dry flat. If it is an intaglio print such as an etching it is turned face up on a dry blotter and air-dried. It is then lightly dampened by spraying with water and flattened under blotters and glass. Therefore, there is no danger of flattening out the raised ink in a soaking wet paper.

Figure 3. Poorly Framed Picture

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Framing

The greatest enemies of art on paper are framers. With the exception of a few careful, ethical people, framers use poor quality materials in a sloppy fashion. Their favorite materials are corrugated cardboard, newsprint and grey and orange ground wood-pulp cardboard (Figure 3). Not only do these boards ruin the picture on paper in the way described before, but the cardboards themselves become brittle and are easily broken. If one of these boards is picked up or handled carelessly it can break, usually tearing the print at the same time. Ultimately, then, the framing does not even do the job it is supposed to, protect the print from such damage.

Sometimes the drawing is merely taped or hinged, usually with Scotch or masking tape, to these boards. Often it is completely glued down. Paper moves naturally with changes in humidity and temperature and often does not lie completely flat. Framers sometimes feel they must please a client who has no understanding of the natural beauty of paper free to move somewhat with the small atmospheric changes unavoidable even in the best of circumstances. So the picture is glued flat and takes on a dead, glassy appearance. Also, many of the glues used stain the paper.

Obviously these boards must be removed. The easiest way is to float the picture off its mount in a water bath. The adhesive is then rolled off the back with cotton swabs. If the picture cannot be immersed in water the backing must be taken off mechanically. Sometimes a flat sculptor's tool can be inserted between the top layer of the backing and the print. The print is gently lifted off bit by bit by sliding the tool back and forth. The top layer of backing and the adhesive is then steamed off the back. If the picture cannot be lifted off this way, the backing must be removed layer by layer with a scalpel. A blotter is placed on a heavy board somewhat larger than the picture. The picture is placed face down on this with smooth tissue under it and taped all around to prevent slipping and bits of paper or dust getting under it. The cardboard is lifted off layer by layer with a scalpel until the last layer is reached. This is steamed or scraped off.

Mending

When the picture is freed of stains and backings any tears are mended and holes and losses filled. There are several methods of mending. This is the simplest. The mending paper is a long-fibered Japanese mulberry paper. This is torn in strips about $\frac{1}{8}$" wide. The paper is first folded and is then wetted along the fold with a brush and water. The paper is then torn along the water line which leaves a line of long fibers. The edges of the tear are drawn together and aligned. Very thin pure wheat or

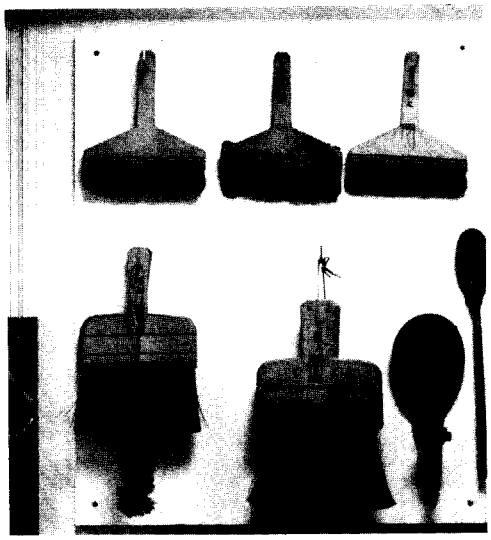

Figure 4. Japanese Lining Brushes.

Figure 5. Brushing Paste on the Lining Paper. The Work of Art Is Then Dampened Before Placing the Lining on It.

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rice starch paste is then brushed on the strip of mulberry mending paper and it is laid over the tear, covered with a blotter and a piece of glass and weighted. After a few minutes the blotter is changed and then left for at least an hour to dry. If the tear is long several mending pieces are used, overlapping the ends slightly.

If there is a loss in the paper it is filled with another paper, either an identical paper or one matching the texture and weight of the original as closely as possible. The color is matched by toning the insert paper with watercolor.

If a drawing is done on a pulp paper of poor quality which is weak and brittle, the conservator reinforces it by lining it with a Japanese paper and very thin, pure, wheat starch paste. The lining technique itself is an adaptation with a few changes of the one used by the Japanese in lining their paper scrolls (Figures 4, 5).

Japanese papers are made from three different plant fibers, mulberry, gampi and mitsumata. The mulberry fiber is very long, and therefore papers made from it are extremely strong and flexible. Also, the fiber is almost pure cellulose and the methods of manufacture employ pure water with no bleach, thus producing a nearly neutral paper.

Mulberry papers are almost universally used for lining, but sometimes a gampi paper is used. The gampi lining papers are *very* thin and translucent. The fiber is not as long and flexible as the mulberry and, therefore, the gampi papers are not as easily manipulated in the lining process. However, sometimes a very delicate drawing on a thin paper needs a lining that is almost invisible, which a gampi paper is. There are many different types and weights of mulberry paper giving a wide choice of suitable papers for the particular drawing the conservator is lining. Different types of drawing papers need different strengths and weights of lining papers. Too thin or thick, too strong or weak a lining paper can cause the lined drawing to curl and not lie flat.

This paper presents a very brief outline of some of the more common paper conservation techniques. One of the most critical events in the life history of a print or drawing is when it is given over to the care of a conservator. That is why it is necessary for those responsible for this type of collection to know something about the general procedures used in a paper conservation laboratory.

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Computer-Based Union Catalog Project for the University of Missouri

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■ Activities are outlined to design and build a prototype system to place within one or more of the University's computer systems a description of each of the approx. 1.4 million books held by one or more of the libraries on the four campuses of the University of Missouri. The problems are delineated and the scope of the work by the Department of Information Science is described.

THE PRESENT DAY CRISES in libraries, their services, their operational costs, and their effectiveness seem to be world-wide. In broad terms, this problem appears to be part of the so-called "information explosion." Whether "information explosion" is an overused phrase or whether it has been accompanied by an increase in truly valuable information and/or wisdom is incidental to the problems that face a major university library system. The libraries are, in fact, confronted with a rapidly increasing number of published volumes and serials and a rapidly increasing number of faculty and student users. Consequently, it has been acceptable (indeed almost necessary) to give consideration to the broad question: "How might the new electronic and computer technology assist a university in its library problem?"

The book itself plays an interesting role in one's thinking about these problems. Emotionally, it is at least a symbol of the dusty, traditional, warehousing approach to information storage. Yet at the same time, the book represents a brilliant and probably the most convenient achievement for information storage and transmission. It would be redundant to enumerate the various delightful qualities of books, viewed from the vantage point of the person who actually holds in his hand the book that contains something he wishes to read. Likewise, it would be redundant and discouraging to recall here the problems such a volume represents to the librarian whose job it is to become aware of, locate, order, finance, catalog, store, retrieve, and ultimately to direct the user to that book.

Clearly, then, there are many problems for users and librarians, and consequently, for computers. The scope of this project will be described in detail in a following section of this paper. Let us merely state for the moment that the

project is not in any way directed toward solution of the librarians' serious "housekeeping" problems in the areas of purchasing, storage, binding, or circulation control. Our studies do not take up the issues of efficiency with the internal management of the libraries and their physical environments. We concern ourselves with how the faculty or student user might better avail himself of the present (often ample) library resources of the University of Missouri.

One further item of background should be noted. Initiation of this project corresponded with a time at the University of Missouri in which three major processes were occurring at once. First, the Curators of the University,* the President, and the campus leaders had committed themselves to a policy of integrating four separate campuses into one major university system. Along with this policy were the natural commitments to long range planning for statewide needs, avoidance of unnecessary duplication of facilities and efforts, and hopefully optimal use of present resources. Second, the Curators (and indeed society) acknowledged the needs for major growth within the University in terms of enrollment of more students and creation of new relevant programs, and the needs for especially significant growth on the two major metropolitan campuses at Kansas City and St. Louis. The third major process was the allocation of money specifically for the faculty projects which aimed at better use of University resources by all campuses. Indeed, special attention was given to the prominent library issues by the creation of a specific Library Improvement Fund.

In the face of these major commitments and needs, it was disheartening to discover certain significant problems for orderly planning. These will be noted, since they tended to shape the direction this present project necessarily took.

Selected List of Problems for Library Improvement

1. There is a clearly demonstrated need to improve and greatly expand library collections at all campuses, but especially at St. Louis and Kansas City.

2. In the face of this, each campus currently has special resources and even special collections which represent real and even unique strengths. There is, in other words, some specialization within the University system. Both items 1 and 2 were discussed and at least partially documented by 1969/70 meetings of the University Wide Library Committee.

3. The special strengths and special collections are identifiable by librarians and selected knowledgeable faculty but are not necessarily identifiable through the library card catalogs. For example, the University Wide Library Committee was told in the spring of 1970 that of the excellent collections selected for purchase through the Library Improvement Collection Fund, probably 80% of the individual new holdings would not be indexed in the card catalogs. They would, in other words, be available to and very much used by subject matter specialists, but might not make their maximal contribution to the general collection of the University holdings.

4. No one could say what percent of University of Missouri–Columbia holdings were being duplicated on other campuses—either by present holdings, planned future orders, or user requests. Ralph Parker, Dean of the School of Library and Informational Science, guessed 40%–60% of the books on any other campus already existed within the University of Missouri–Columbia library. The prospect of calculating the actual percentage through manual searching appeared practically impossible.

5. Naturally, all those considering these problems have stressed that "some amount" of duplication of book purchases among the four campuses would be reasonable and desirable, and that this would "naturally" be determined by frequency of usage. Unfortunately, there are very few actual usage figures for the

* The governing board of the University.

University of Missouri or any other large library system. What few exist for the University of Missouri derive largely from the automated circulation control system at the University of Missouri–Columbia and these deal with a fraction of the total UMC holdings and do not deal at all with books searched for but not found.

6. A final constraint, like the others, can only be expressed in rather ambivalent terms. The University appears in the past to have dealt very favorably, generously, and justly with book purchase needs and requests. It would not be reasonable, therefore, to look toward a major increase in the fraction of the budget expended on book purchases. Consequently, one seemed obliged to seek methods for improving access and utilization of present and future collections by faculty and students, to seek information which would be needed by the University in formulating long range plans for libraries, and to do all these things at minimal essential costs.

Scope of the Project

Potentially valuable studies and projects could be directed toward a host of fundamental and practical problems. These span a spectrum from questions of library management to human perception. Within this spectrum are some promising potential studies, all also potentially competing for the same support. A careful elaboration of these additional improvement opportunities might be a worthwhile effort.

Out of the numerous potential project objectives, a limited but meaningful few were selected for this project. We would attempt to accomplish the following:

1. Design a computer-based union catalog system of book holdings which potentially could be used by the libraries of the four campuses of the University of Missouri.
2. Describe the problems and solutions entailed in such a task.
3. Carefully estimate the costs involved, and where necessary, evaluate the alternative systems and benefits.
4. Make a recommendation concerning this project for the University to consider.

The task was to design and evaluate a system, and by implication, therefore, to build a test or prototype system. The funding which was requested and awarded was adequate for this task; it definitely was not adequate to meet the costs of actually building the total four-campus system for the University's approx. 1.4 million holdings.

Plan of the Investigation

The work of the project divided itself into the following tasks:

1. Understand the nature and magnitude of the present libraries within the University of Missouri. Seek mechanisms for continually refreshing one's awareness of the libraries' needs and resources.
2. Review and continually evaluate the published literature describing efforts at other institutions to create computer catalogs of holdings.
3. Create or modify a computer system or network design which potentially will be adequate for the ultimate four-campus job, but which will be practical during the initial much smaller test phases.
4. Tackle the problem of data collection. How could a description of all the book holdings of all the University of Missouri libraries be rendered "machinable"? Evaluate and compare the available methods, and use one or more to create actual computer records of some definable subset of the University of Missouri holdings.
5. Operate a test system for a limited period of time with actual faculty and student users. Evaluate the costs and benefits.
6. Sponsor, encourage, and collaborate with whatever ongoing research within the University might produce information pertinent to the Union Catalog Project.
7. Based on these considerations, formulate recommendations.

The status reports and documentation would be organized to correspond with this plan. The personnel working groups were, of course, not necessarily organized in precisely the same fashion. Status reports would contain the most current "Tentative Conclusions" and any "Recommendations" which the current status appears to justify. The reader then would evaluate the worth of the conclusions and recommendations, taking into account their date of publication and the fact that they might be incomplete or even incorrect depending upon the outcome of subsequent experiments. It was planned to issue multiple status reports and/or "Documentation Notes" whenever justified by the completion of a subtask or related project. Each one was to be dated.

Data Collection

Some time and consideration were given to the subject area of the Union Catalog Project. It was felt that either the History Department or the English Department on the four campuses contained the most students and faculty. As it developed, the English Department of the Columbia Campus had 483 students and 23 faculty as compared to 382 students and 22 faculty for the History Department. It was decided to identify a subject area in English literature; the work of Samuel Clemens was chosen as a beginning point because of his close connection with Hannibal, Missouri.

Various means of amassing data were discussed. Bids were obtained from a service bureau for key stroking but this proved prohibitive in light of the funds allotted, so it was decided to use our own keypunch equipment and staff for input.

Shelf list drawers starting with the one containing the Clemens material were photocopied. As each card was photographed, it was stamped on the back. This would later aid in identifying new material added since the initial photocopying.

Graduate students from the School of Library and Informational Science were initially used to do the coding. Each title was marked with the following codes to conform to the paragraphs of the CONSIDER format: author, editor, introducer, helpful henrys, cooperate authors, title, derived title, publisher, collation, notes, tracings, series notes, LC book card number, language, international standard book number, location, and status. Explanation of each of these "paragraphs" together with instructions for coding the photo-reproduced shelf list cards was compiled into a "Manual for the University of Missouri Book Catalog Project."

The use of graduate students was not always ideal. Since they had little experience in cataloging, they frequently were unable to recognize problem areas, their time was limited, and often they would leave the project because of exams, graduation, etc. In October 1970, a librarian with many years of cataloging experience was hired half time; this arrangement proved more successful.

A shelf list drawer usually contains from 800 to 1,100 titles; a completely full drawer can hold as many as 1,600 titles (rule of thumb, 100 cards per inch; a shelf list drawer has 16″ of usable space).

The coding was done on the photocopied sheets using the abbreviations for the paragraphs. These abbreviations were placed as close to the information as possible. As of June 8, 1970 the following estimates of time involved in the preparation of the coding for the computer for one standard drawer were:

Copying	3 hours
Coding	5 days
Edit I	2 days
Edit II	½ day
Keypunching	10 days

In July 1970 two MT/ST's were acquired and the procedure for the actual capture of the data was slightly modified. Some of these changes included: 1) type the data and record on MT/ST tape cartridges; 2) edit and make corrections on the original typed copy; 3) correct the MT/ST tapes by either changing the original tape or transferring the

entire entry, with corrections, to a new tape, and 4) convert (on IBM 360/65) the MT/ST tape to the CONSIDER 80-character format and store the results on computer magnetic tape.

Two inexperienced operators were hired to operate the MT/ST's during July and August. The rate never reached more than eleven titles per hour with a moderately low error rate for one operator with the other reaching six titles per hour with a medium error rate. It should be emphasized, however, that typing speed is not as essential as is accuracy for this project.

Coding, with the experienced librarian doing all the coding, increased until the average for a four-hour period reached 50–60 titles. These statistics are for Oct 12 to Dec 4, 1970.

Coding

	Units/ hr.	*Wage/ hr.*	*Cost/ unit*
Graduate Student	40	$3.61	$0.09
Professional Librarian	55–60	4.82	0.08

In the beginning of the program a student in the Graduate School of Library and Informational Science who was finishing his program was employed to do the coding. He had had the basic and advanced courses in cataloging. Due to his lack of actual cataloging experience, the co-director of the project had to spend much time in making decisions and explaining details. This was also true for two other graduate students just beginning their graduate education who were hired on a part-time basis in the one instance and in the other, the student receiving credit for his practicum.

The professional librarian who began work on the project in October 1970 has had over 20 years of professional experience, much of it as a cataloger. With the exception of initial familiarization with the project, the co-director has had to spend a minimum of time in explanations and decision-making.

We found that both the operators of the MT/ST and the keypunch must first locate the data on the coding sheets and then mentally format them. This means strict adherence to the rules laid down not only in the coding manual but in the use of the MT/ST. Some of the problems encountered with the MT/ST were not experienced with the keypunch. Too many rules often result in confusion, and errors follow. This suggests that the MT/ST operator should be intelligent enough to follow rules closely, but also be able to ask questions. It also suggests that someone with experience in the use of libraries, who had done similar work, would be an ideal person for this task.

There has been a strong tendency to disobey rules and use some of the features of the MT/ST which produce errors on the tape which are not on the typed copy, and therefore cannot be edited. The machine should be modified to eliminate undesired operations and prevent accidental errors.

The same person codes (with part-time assistance) and edits. From her point of view (or any librarian's) the shelf list order of entries should be maintained. This means that one MT/ST operator should do all of one drawer and that it not be divided among several operators. Although it is true that too many rules affect anyone's editing efficiency, an experienced librarian invariably will do the best editing. It is difficult to bypass library format and maintain uniformity.

Experience based on our use of the MT/ST in typing one drawer with recommendations appears in Figures 1-4.

All of the following statements and statistics are based on passing a single typical drawer through the entire process (namely, Drawer #7). Figure 1 gives the percentage of entries containing errors and Figure 2 gives the percentage of entries that had to be copied. An entry had to be copied whenever the net change in the number of characters was one or greater. Table 1 shows the frequency distribution of the net change in the number of characters per error, and Figure 3 gives the cumulative relative frequency graph for this distribution. It is important to consider that

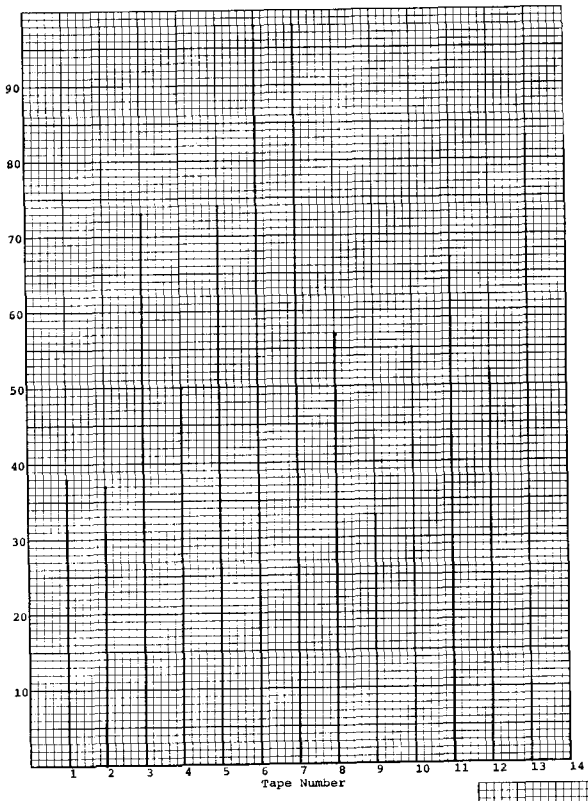

Figure 1. Percentage of Entries Containing Errors

For one drawer there were 14 MT/ST tapes. The chart shows the percentage of entries containing errors per tape.

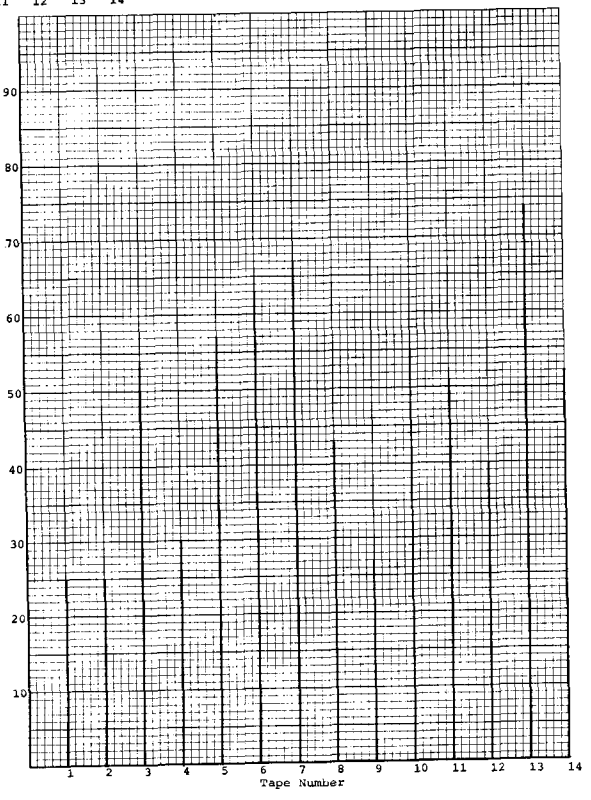

Figure 2. Percentage of Entries Copied

An entry had to be copied if it had an error requiring the addition of one or more characters. The chart shows the percentage of entries that had to be copied from each tape.

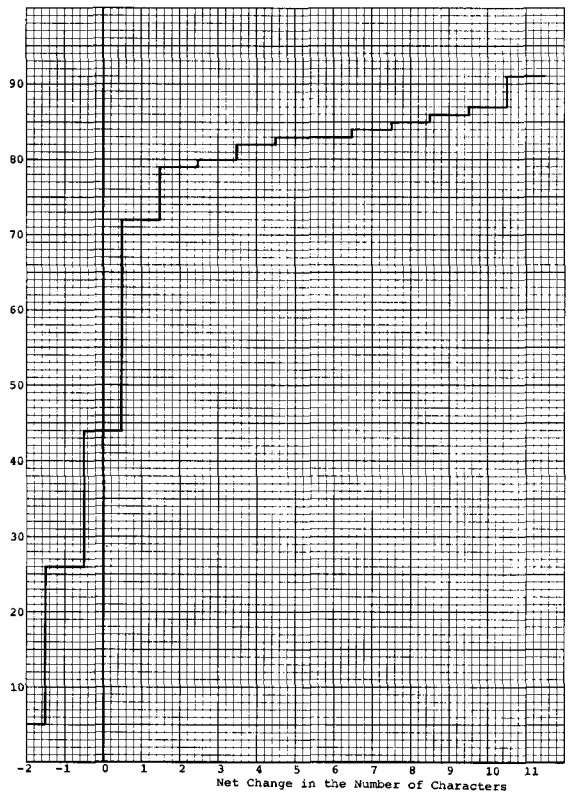

Figure 3. Cumulative Relative Frequency

The chart shows the cumulative percentage in which the errors occurred. An error was considered to have been made whenever a change in an entry had to be made. What constituted a single error was determined by the searching of an MT/ST tape required by the typist to correct the error. Thus, for example, deleting an entire sentence was considered a sing'e error since the typist would have to search only for that sentence. If two non-contiguous words in a sentence were in error, that would be considered two errors since the typist must make two separate searches to locate the errors.

The net change in characters for an error is determined by subtracting the number of characters that must be removed from the tape from the number of characters that must be added to the tape. Three examples follow:

Word in Error	Correction	Characters Removed	Characters Added	Net Change
Twian	Twain	2	2	0
Twan	Twain	0	1	1
Tweain	Twain	1	0	—1

In Table 1 the left hand column divides the integers greater than or equal to —59 into 23 groups. Corresponding to each group the right hand column lists the number of errors whose net change in characters fell within that group. Thus, for example, there were 11 errors for which the net change in characters was between —9 and —3.

Of the total of 837 errors made, 44 had a net change of —2 or less. Thus the cumulative frequency for —2 is 44. Similarly, cumulative frequency for any other entry in the left hand column is found by adding its frequency to all of those above it. To find the cumulative relative frequency for any entry, divide its cumulative frequency by 837. Thus for —2, the cumulative relative frequency is 44/837 = .052 or approximately 5%. Hence, note that 5% of the errors made required a net change of 2 or more characters being deleted. Figure 3 plots these values for net changes from —2 to +11. The significance of this chart is in the consideration of the possibility of leaving space on the MT/ST tapes for error corrections. For instance, we can see from the chart that if we could allow one extra space per error, we could correct 72% of the errors on the original tape as opposed to 44% when no space is allowed.

Table 1. Frequency Distribution of Net Change

The left hand column shows the range of changes in number of characters necessary to correct the errors—from 59 characters deleted to an excess of 49 characters added. Opposite this tabulation is shown the frequency in which these occurred.

Net Change	Frequency
(—59)–(—30)	4
(—29)–(—20)	7
(—19)–(—10)	11
(—9)–(—3)	11
—2	11
—1	170
0	156
1	233
2	61
3	8
4	15
5	5
6	5
7	6
8	11
9	8
10	4
11	32
12–19	19
20–29	17
30–39	14
40–49	20
49+	9

some of the errors made on the first drawer were recurring errors due to incorrect format rather than strictly typographical errors.

The error correcting procedure has proven to be too complicated. Its ability to disorganize things tends to introduce errors (such as omitting an entire entry accidentally). Even if we can obtain system modifications to guarantee that what is originally typed is actually on the tape, it still would be necessary to print out the corrected entries to guarantee their validity.

Probably one thing that cannot be simplified is our access method for the IBM 2495 (MT/ST tape cartridge reader). If we used the IBM utility TCRGENER as currently available to read the MT/ST tapes, there would be no significant advantage of the MT/ST tapes over card entry (other than the fact that MT/ST tapes do not get out of order when dropped). The cost of one drawer has been reduced from about $6.50 to read cards to less than $0.10 to read the MT/ST tapes. The processing program was written with the idea of keeping costs to an absolute minimum. This turned out to be about $0.10 to $0.12 per MT/ST tape cartridge. This probably is a false economy, though, since money has had to be spent to verify the data.

If errors are left uncorrected in the data, there are two possible consequences. First, the error might be detected by the processing programs. In this case the error may cause the processing program to be terminated; processing of the data cannot continue until the error has been corrected. Second, the error may not be detected by the processing programs. In this case there can be several effects upon a user; these range from nonsignificant misinformation to very significant misinformation to a very significant loss of an entry. For example, suppose an entry contains the words **Mark Twain** only once and this is entered as **Mark Twian.** A person searching for all entries containing "Mark Twain" will not retrieve this record; effectively the error in entering data has resulted in a "lost" book. On the other end of the scale, if the error occurs at a point other than the user's entry point to the record, then the user receives misinformation and the result of this depends upon the use the requestor makes of this information. If it were, for example, in the collation paragraph and the user ignored this paragraph, there would be no effect. However, if the error were in the call number, the user might not be able to find the book on the shelf; again, the book has effectively been "lost" to the user.

There are probably two areas in which to make changes. First, there are desirable machine modifications which would allow one to know exactly what is on the tape (or at least to a degree which guarantees the accuracy of the data). The second area would be to modify the processing program to simplify the rules as to what is an acceptable tape. Included in these changes would be a change to take advantage of the two tape switching capabilities of the MT/ST for error correction. To some extent these changes depend on machine modifications made, although the basic and extensive changes do not. Although these changes would be reasonably difficult and time consuming, at least the most difficult area of the operation, the I/O, need not be changed.

As to future plans for the project? We have obtained an IBM ATS (Administrative Terminal System) for direct input into the computer. It is felt that some of the problems which seem to be inherent in the use of the MT/ST can be eliminated. This is especially true of making corrections, now one of the most difficult processes in the program. As to the data base, there are some 10,000 titles as of this writing and that number should have been increased to 15,000 to 20,000 very soon. The plan is to store this data equivalent to five shelf list drawers at one pass.

The System

We set out to create a prototype system using an already developed program

—CONSIDER. We feel that we have proved that this program can meet the needs and demands of a modern university library and its users. The system quickly indicates to the requester how many entries in the data base fulfill his logical request; permits him to look at the book titles; and finally gives him, through the EXPAND command, the full bibliographical details of that title or titles which seem to meet his needs.

The system is designed to be accessed via CRT or by TWX. We use both and find response time does not vary, but realize that a portable TWX with an audio coupler represents the most economical means of access. Although access time is identical with either the CRT or the TWX, response is slower on the TWX as it is necessary to wait for the answer to be typed line by line.

This system can do things for the card catalog user which cannot be provided in its traditional 3″ × 5″ format. It can locate publishers, dates as well as all words which appear on the original card but for which no entry was made. It is possible to look for stem words and dates, thus making it possible to look for a given author's poetry under the word "poe . . ." and receive in response the words poetry, poem, poems, poetical, etc. However, it would not give Edgar Allan Poe as his name would not be considered a stem word.

Finally, we feel that the program can do the things we claim. We do not advocate that this system is better than any other. It has been an interesting research project, and the already developed CONSIDER program permitted us to begin data input immediately without waiting for a new program.

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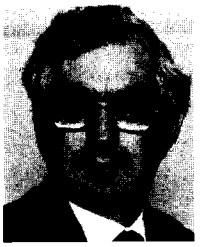
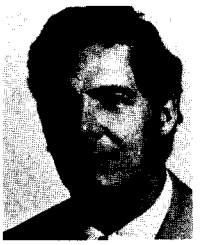


SARGENT



LINDBERG

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The Inventory of a Special Library Collection

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■ The inventory of a special library collection imposes an appreciable work load on the library staff. It should be done only after careful planning in which the library staff participates and after the users have been advised of the necessity of the activity and the procedures to be followed. It will result in an increase in the number of books available to the borrowers, a re-establishment of the concept of the library ownership of the books in the collection and increased accuracy of the library records. The inventory procedure in a mechanized library is described.

OVER THE PAST TEN YEARS, IBM's Thomas J. Watson Research Center Library has conducted three inventories of its collection.

A library inventory is a demanding exercise which imposes a considerable burden on the staff and something of an imposition on the users. The decision to undertake an inventory should be based on the assumption that the costs entailed, and they are appreciable in both the actual labor cost and impact on staff morale, are less than the benefits to be obtained.

Costs and Benefits

The direct cost of a library inventory can be determined by the number of hours spent on the activity multiplied by the hourly rate of those involved plus the material costs of notices, new cards, return slips, and the labor involved in correcting the record. The intangible costs of staff fatigue and inconvenience to the users are more difficult to measure.

The most obvious benefit of an inventory is that it results in the return to the library collection of borrowed books that users no longer need. The library browser then has ready access to books on the shelves which previously may have been locked in a borrower's desk, hidden in his cabinets or safely protected by residence in his home library. If the inventory results in the return of 1,000 books to the collection, the enrichment of the available resources can be measured. If, for example, the scientific technical book costs an average $13.00 and the cost of ordering and cataloging a book is $10.00, the inventory-induced return of 1,000 books has increased the value of the stack collection by $23,000.

The users of a special library can be self-centered, certain that they are the only ones who really need the books they have borrowed. They can also be very possessive. A library book which they have held for six months becomes "their" book. The requirement to return a book for physical inventory re-establishes the library's proprietary rights to the book. This may be a minor psychological

achievement but it is important. The library that recalls books for inventory is more likely to be successful in recalling borrowed books for other users than the library that has lost all control over its absent collection.

Neither the costs nor the benefits can all be expressed quantitatively so the librarian may have to depend on intuition in the end.

Computerized systems are subject to record loss. While it is the fashion of the times to point a finger at the electronic gadgetry and blame the computer, investigation frequently absolves the mechanism and places the onerous responsibility where it rightly belongs—on the librarian who provides the input, the operator who feeds it into the computer, or the programmer who has told the computer what to do with the data it is given to process. The inventory not only identifies but permits a correction of these man-machine errors.

The 1971 inventory was undertaken because the number of books on loan to our 700 users exceeded an average of 10 books per borrower; the computer originated shelf list record had been contaminated by errors of omission and commission of input cards. The cataloging staff had not always pulled the shelf list punched card for catalog corrections and had occasionally added a book to the collection without verifying that there was a punched card for the added volume. A programming blurp, when the circulation procedure was rewritten for the Model 30, lost some of the records of loans. Most of these were recovered by retracing the loan records, but the suspicion lurked in the minds of the library staff concerned with circulation that not all of the records had been reestablished.

The decision to make the inventory was made on the intuitive judgment that the benefits to be derived from the inventory, the reduction of volumes on loan and the revalidated integrity of the records, warranted the cost. Once the decision was made to take the inventory and the planning was accomplished, the staff plunged into the effort.

The Task

In 4½ days the 28,000 volumes on the shelves were inventoried. The recall of the books on loan took longer. A three man team tackled this chore and their labors were spread over a seven week period.

The exercise produced a packet of information which may be useful to other librarians contemplating an inventory.

First, the library staff should be alerted to the upcoming inventory. Their cooperation can be achieved if they understand the necessity, objectives and benefits which will accrue to the library as a result of the activity. Second, the inventory should not be sprung on the users without advance notice. A month in advance of the inventory the library borrowers were sent the following memorandum:

> To: All Research Employees
>
> *Spring is just around the corner—isn't it time you cleaned out your office and your office-away-from-the-office at your house? Those library books you borrowed to peruse when the snow started falling could be returned to the library. To assist you in spring house cleaning, the Research Center Library will conduct its periodic inventory in March. We hate to do it, and it will hurt us more than it does you; but next month we will ask you to return all library books so we can take a physical inventory.*
>
> *You can ease the trauma a bit by making a first sweep and sending back to us now all of the books you don't really need. Our records show that 741 of the Research Center people currently have on loan 7,500 books from the library. We are pleased that you like books. We'd be out of work if you didn't. But really, do you actually need all of those tomes you have in the closet? Please send back now those you haven't looked at in the last month, and we'll heckle you later for the remainder. Don't return now those you need on a continu-*

ing basis. We will call them in on a schedule which will enable us to give 24-hour turn-around service.

It worked. The number of books returned following the mailing of the memo was triple the normal rate and the circulation clerk suggested that she be excused from the inventory assignment; she had already done her tour of double duty.

Steps to Follow

The basic plan for conducting an inventory is deceptively simple. It falls into four phases. The books on the shelves must be checked against the shelf list. The remainder of the shelf list must then be checked against the circulation record. These two checks will disclose certain problems. Books will be found on the shelves and in the circulation record which do not appear on the shelf list; in some cases books will appear on the shelves and a record of the loan of the same book will appear on the circulation record. The third phase of the inventory is devoted to correcting these errors. Once the discrepancies of records are resolved, the fourth and final phase is removing from the shelf list the record of books not found and adding to it the record of books which the inventory disclosed were in the collection but somehow had escaped inclusion in the shelf list.

Although the plan is simple, implementation is a trifle more complex and involves much grubby, hard, monotonous work. In the first phase the books on the shelves are checked against the shelf list. Presumably, the shelf list is in perfect order; the books certainly are not. Prior to inventory, the shelves must be read and order reconstructed in the collection.

The Team

A team approach to the inventory activity is desirable. One effective method, if the staff is large enough to afford it, is a three-man team. A page brings books from the shelves, a second member records the book in the shelf list record or indicates its absence, the third member records the date of inventory and the number of loans in the book and the page reshelves it. The record of the number of loans can be recorded next to the inventory date as a guide for subsequently making the decision to weed or retain the book in the collection. An even more obvious indication is to replace the original circulation card with a completely new and different one. This is relatively simple in a mechanized system but costly in a manual one. If the staff is large enough, two or more teams can attack the inventorying of the books on the shelves simultaneously. To improve efficiency, inventory teams can be limited to a two-hour stretch at a time. Rotated teams of three people can inventory as many as 2,500 books a day per team.

This activity will produce a number of problems which range from missing labels and loose book pockets to books for which there are no inventory records. For expeditious processing, these should not be handled by the inventory team for it would diminish their effectiveness.

The second step is the inventorying of the books on loan. Many librarians will be tempted to accept the lending record as adequate proof of the existence of a book. In libraries that can police loans and require their return in two weeks or a month or obtain reimbursement for their loss, this may be acceptable. But in a special library where books are often loaned for an indefinite period, which may run into months or even years, the books should be physically inspected to determine that they are, in fact, still in the collection. The temptation to send a list of books to each borrower with the request that the borrower verify the correctness of the record should be avoided. It is altogether too easy for the busy borrower to take a quick glance at the list, recognize most of the titles as books which he has and return it accepted but unchecked. If this procedure must be followed, the borrower should be required to record on the list some indication that he has ac-

tually checked the book. Ask him to write in the copy or accession number which he can get only from the book itself. This will verify that he still has the book but will not result in recording in the book the fact that it has been inventoried.

Recall Books

To ensure the validity of the inventory, the loaned book should be recalled for inspection and marking. Each borrower should be provided with a list of all books on loan to him and asked to return those and any other library books he may have. The recall should be scheduled at a rate which will enable the inventory team to process all books received within a day of recall. In addition to the list of books, the user should be provided with preprinted slips on which he can record his name and address and which he can insert in the book pockets of those books he wants returned. It will help the inventory team if these slips are long enough to protrude from the book. The recalled books which are to be returned to the borrower will then be obvious to the inventory team and they can give priority to inventorying those books with the projecting slips.

The users of a mechanized library become inured to computer-produced overdue notices. The inventory recall notices should be obviously different from the usual overdue notice. A number of years before, we had obtained permission to use a cartoon for recalling sorely needed books from reluctant-to-return borrowers. A copy was stapled to each borrower's list. It is also helpful if the inventory recall list is hand delivered by a library staff member who can then schedule a pickup a day or two later. This gives the borrower an opportunity to bring back the books he has taken home and to obtain from his colleagues those books he has loaned them informally.

Even the most tractable of library borrowers is subject to good intentions and failing memory. Rather than depending on the borrower to personally return his books to the library or send them back via the company mail, a staff member may make the pickup.

Inevitably, there will be in any special library one or two non-conformists who just cannot bring themselves to cooperate with the inventory team. After every reasonable effort has been expended in attempting to locate the borrower and his books, the librarian has the choice of either writing off the loans or jeopardizing library relations by advising the borrower's manager that his account will be charged for the unreturned books.

Reconciling the Records

Just because all books on the shelves have been inventoried and all loaned books recalled, the librarian should not yet celebrate the completion of the inventory. There are still two dreary and monotonous chores to be done. There will be a remainder of the shelf list which has not been located and a number of loaned books which the borrowers insist they have returned. Both the shelves and the new circulation record must be rechecked before the book should be officially recorded as lost. During the inventory of the books on the shelves, it is inevitable that some books will be overlooked and some of the borrowers will be correct when they insist they have returned their books. Once the loss has been verified, the official records of the library, the shelf list and public catalog, should be corrected to reflect this loss. Only when this last phase has been completed, months after the inventory was started, can the librarian relax.

Mechanized Systems

In the preceding paragraphs there have been a number of references to mechanized libraries and computer-based records. One of the fringe benefits of a mechanized library is that the computer can produce a number of tools which make taking an inventory easier and possibly more accurate. A machine-based shelf list can be used to produce a separate card for each book in the collection. If this separate card is a new circulation card with a different appearance

Table 1. Loss Rate

Books on shelf list at beginning of inventory	34,011	
Lost books removed from shelf list between 1968 and 1971 inventories (estimated)	600*	
Books returned during inventory (not in shelf list)	341	
Total collection on which to assess loss		34,952
Loaned books not found	372	
Reference books not found	134	
Circulation books not found on shelves or in loan record	725	
Books lost between inventories	600	1,831
Loss rate for three years		5.2%
Annual loss rate		1.7%

* This is estimated on 1970 loss of 216 books. In 1968 and 1969 there was no distinction made in our records between a withdrawn and a lost book.

from the previous circulation card, and if, in the inventory process the old circulation cards are replaced by new ones, the determination that a book has been inventoried is made easily by checking the circulation card.

The computer can print out lists of books on loan to each borrower quickly and inexpensively for the initial recall of loaned books.

Regardless of the militant efficiency of the inventory team in their efforts to recapture books on loan to borrowers, "lost" books will wander back into the collection after the inventory is completed. One certain way to encourage a cataloger to apply for a position as a reference librarian is to ask her to return to the catalog record a "found" book which she had removed from the shelf list the previous week.

Because the incidence rate of finding lost books is heaviest during the first six months following the inventory, it is possible to charge all unfound books out to missing with a due date of six months. Lost books which wander back will be carded and automatically inventoried. The computer-produced overdue notice can be checked against the shelves and only those which are still missing six months after the inventory need to be removed from the shelf list.

Losses

At the completion of the inventory we tallied the results. These are summarized in Table 1.

When library inventories are discussed, the question of an acceptable loss rate inevitably is broached. No loss from the library resource is acceptable. On the other hand, dogs do chew up books borrowed from the library, they do get left in airplanes, they are borrowed informally and they are inadvertently packed with personal papers when a library user leaves or is transferred. Attrition of the collection by loss may not be acceptable but it does occur.

As in many other areas of special library activities, there is not enough information in the literature to establish a norm. Losses do occur in all libraries. They must be expected. To avoid them, unnecessary and arbitrary restrictions on library services should not be imposed. It is better to lose an occasional book than to deny ready access to the special library collection by the users.

In the absence of any statistical data on which to base a recommendation, intuition is an important basis on which a standard can be suggested. What occurs in one environment may not be applicable in another. Where comparable conditions prevail, if the loss rate is more than double that which was experienced at IBM's Research Center Library, procedures should be reviewed to establish better controls; if it is appreciably less, controls may be too restrictive.

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Centralization vs. Decentralization:

A Location Analysis Approach for Librarians

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■ An application of location theory to the question of centralized versus decentralized library facilities for a university, with relevance for special libraries is presented. Locating university libraries near classrooms, offices, and dormitories requires a larger budget than combining these libraries into a centralized facility. Yet there is a cost to the university community which does not appear in the university budget—a cost in time, energy, and decreased use resulting from locating the library a longer distance from users. The analysis provides models for a single library, for two or more libraries, or for decentralized facilities.

A QUESTION that seems to perplex many university and special librarians is whether to move toward centralizing or decentralizing the library's collections and facilities. The Association of Research Libraries, in a report entitled *Problems in University Library Management,* has stated the problem this way *(1):*

> *Librarians are caught between conflicting pressures for centralization and decentralization of collections and, consequently, facilities. University administrators desire to hold duplication of collections and dispersal of services to a minimum. Faculty and graduate students press for decentralized departmental libraries.*
>
> *The issue of centralized versus decentralized facilities poses major management problems for university librarians. In planning new construction and considering changes in existing space utilization, the librarian must decide whether it is more efficient and effective to decentralize or to centralize operations. Librarians indicate that little data are available to assist them in making such decisions.*

Locating university libraries near the classrooms, offices, or dormitories of those who most frequently use them requires a larger budget expenditure than combining these decentralized, smaller

* Any views expressed in this paper are those of the authors. They should not be interpreted as reflecting the views of The Rand Corporation or the official opinion or policy of any of its governmental or private research sponsors.

libraries into a large, single facility. Yet many have argued that there is a cost to the university community which is not shown in the university budget—a cost in time, energy, and decreased use resulting from locating the library a longer distance from users. Location theory allows the analyst to examine economies of scale and the cost of overcoming distance simultaneously to determine the optimal location and size of university libraries for a given level of services *(2)*.

Location theory considers the overcoming of distance as an input of the production process. Naturally there is a cost incurred in doing this. The library problem is not entirely analogous. University libraries are not producing commodities but rather providing services. Similarly, the objective of the library presumably is not to maximize profits. Defining the library's objective for this paper in terms of minimizing the cost of maintaining a specific level of benefits simplifies the problem by not allowing the level of services (or "production output") to vary. It is assumed in our model that the level of output is determined by university policy (which itself may be a function of the costs and benefits associated with different levels of library activities).

Presented below is a theoretical approach to the library centralization-decentralization question and several specific applications for M.I.T., though applications to special libraries should be readily apparent.

The Market Orientation of Libraries

Libraries are "market" oriented, that is, their location is sensitive to the location of users, because 1) the average cost of transporting books from the central processing unit is less than transporting books between the library and its users, and 2) the number of books entering the library from the central processing unit is less than the number transported to and from users. At M.I.T., for example, while about 60,000 items must be processed annually (catalogued, stamped, etc.), these items are delivered only once on weekdays at a regular time by an unskilled messenger to the decentralized library collections. Given the large cost of processing (over $500,000 annually) and the small cost of transporting books to libraries (under $10,000) the economies of scale associated with book processing lead to the maintaining of a single book processing unit. Leaving (and then returning) to the libraries are about 250,000 books per year, transported by highly paid and highly skilled people (faculty and students) up to 14 hours daily at irregular intervals *(3)*.

The information production process can be modeled in the following way: the processing station is a source of inputs, that is, books; the library branches are sites of circulation production using the books received from the processing station; finally, the places where consumers of books and material originate, for example, offices, dormitory rooms, can be considered the market sites. Transportation costs are incurred at each stage of the process. These costs can be lowered in general by locating the circulation production sites (branch libraries) near the markets, if other costs (wages, rents, etc.) do not vary by location. The analyses below concentrate on the location of libraries *vis-à-vis* the location of users.

The Location Analysis Approach

Each location may be expressed in terms of its map coordinates **(a,b)**.* Any degree of precision can be obtained simply by making the grid on the map coarser or finer. For the case of a university community, the grid could also be extended to include off-campus student residences, public libraries, etc.

The distance between any two points (a_1, b_1) and (a_2, b_2) is determined by the formula:

$$d' = \sqrt{(a_2 - a_1)^2 + (b_2 - b_1)^2}$$

* Let us adopt the convention that (a,b) means Row **a** and Column **b**. This is convenient since it is consistent with the convention of identifying matrix elements by a row denoter followed by a column denoter.

Thus (5,3) is 5 units from (1,6). To reduce the calculations necessary in the quantitative analyses below, an approximation was used. Distance was measured by counting the number of adjacent or diagonally adjacent squares along the shortest route between two points, so that (5,3) would be 4 units from (1,6). For "coarse" grids this distance, d, could also be approximated by the formula $d = \text{maximum } \{|a_2 - a_1|, |b_2 - b_1|\}$ where $|x|$ is the absolute value of x; that is, the sign of x is ignored.

It is convenient to summarize the distance of a specific location from all other locations. For example, if we know that all students have classes in the "main building," how many distance units away is each possible location of a library? The distance matrix below is a convenient way of summarizing this information:

$$\mathbf{D(a,b)} = \begin{bmatrix} d_{11} & \cdots & d_{1m} \\ \vdots & & \vdots \\ d_{n1} & \cdots & d_{nm} \end{bmatrix}$$

From the location (a,b), the distance matrix tells us that location (i,j) is d_{ij} units away, where $i = 1, \ldots, n$ and $j = 1, \ldots, m$. For example, let us assume a grid which is three units by four units, then

$$\mathbf{D(2,2)} = \begin{bmatrix} 1 & 1 & 1 & 2 \\ 1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$$

The *cost* of traveling from one location to another is not necessarily proportional to the distance from one location to another. For example, traveling less than 1 unit may not require the user to leave a building while traveling 4 units may require a trip outside, travel fatigue, and general inconvenience. The latter trip is usually seen as *more* than 4 times as costly as the first. A method of transforming distance into the cost of "overcoming" this distance is required. This transformation must depend on the individual (in general, the type of user), and the method of transportation (walking, automobile).

The transformation factors for each type of user can be expressed in a table. For example, Table 1 shows the cost of overcoming distance for two types of users.

Table 1. Cost of Overcoming Distance
(units arbitrary)

	Distance Units			
	0	1	2	3
u_1, User Type 1	0	1	3	5
u_2, User Type 2	0	1	2	3

The distance matrices can now be transformed into cost matrices. Using the rate structures of Table 1,

$$\mathbf{D(2,2)} = \begin{bmatrix} 1 & 1 & 1 & 2 \\ 1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$$

becomes

$$\mathbf{C_{u1}(2,2)} = \begin{bmatrix} 1 & 1 & 1 & 3 \\ 1 & 0 & 1 & 3 \\ 1 & 1 & 1 & 3 \end{bmatrix}$$

and

$$\mathbf{C_{u2}(2,2)} = \begin{bmatrix} 1 & 1 & 1 & 2 \\ 1 & 0 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$$

The cost matrix $C_u(a,b)$ thus tells us the cost of traveling from location (a,b) to each point on campus for each user type, u.

Given the cost of one trip to a location, what is the number of trips a set of users will make in a given time period? For this paper we have chosen a time period of one year. To allow for the analysis of decentralized collections, the total library collection is divided into a set of J nonoverlapping subcollections (each book belongs to one and only one subcollection). Let L_j denote the j^{th} subcollection. Clearly it is possible for all subcollections to be located at one point, that is, a centralized library, or for several subcollections to have a common location, or for each subcollection to be housed separately. The whole collection is the sum $L = L_1 + L_2 + \ldots, + L_J$. Just as the library can be divided into subcollections by location, each user type can be divided by his location or "mar-

Table 2a. Number of Trips by User Type u_1

	Subcollection 1	Subcollection 2	Subcollection 3
Market or Point of Origin 1	500	250	1,000
Market or Point of Origin 2	500	0	250

Table 2b. Number of Trips by User Type u_2

	Subcollection 1	Subcollection 2	Subcollection 3
Market or Point of Origin 1	1,000	0	500
Market or Point of Origin 2	250	1,000	250

• •

ket." A market is the origin or starting point of users going to the various library subcollections. Thus, for most faculty members their offices are considered as their origin or market. Let there be I markets; each market can then be denoted M_i, where i is an integer number from 1 to I. Given these subdivisions of users and collections, the number of trips made by user type u to library j from market i is expressed as t^u_{ij}. The number of trips can be conveniently expressed in a "trip" matrix:

$$T^u = \begin{bmatrix} t_{11} & \cdots & t_{1J} \\ \vdots & & \vdots \\ t_{I1} & \cdots & t_{IJ} \end{bmatrix}$$

This trip matrix is nothing more than a convenient and economical way of displaying a large amount of information. The *same information* could be displayed in tables such as Table 2.

In this example, the trip matrices would be respectively

$$T^{u1} = \begin{bmatrix} 500 & 250 & 1{,}000 \\ 500 & 0 & 250 \end{bmatrix}$$

$$T^{u2} = \begin{bmatrix} 1{,}000 & 0 & 500 \\ 250 & 1{,}000 & 250 \end{bmatrix}$$

The total numbers of trips made by all users from all markets to all subcollections is just the sum of all the entries of the trip matrices. In the above example, it would be 5,500.

The total cost to a particular user type of traveling from a given market to each *possible location* of a given library subcollection is found by multiplying the number of trips made by the user from that market to each possible location by the cost of each such trip.

Using the data from Tables 1 and 2, the total cost of User Type 1 traveling from Market 1 located at, say, (2,2) to Subcollection 3 is

$$\begin{bmatrix} 1{,}000 & 1{,}000 & 1{,}000 & 3{,}000 \\ 1{,}000 & 0 & 1{,}000 & 3{,}000 \\ 1{,}000 & 1{,}000 & 1{,}000 & 3{,}000 \end{bmatrix}$$

This total cost matrix was obtained by multiplying each entry of $C_{u1}(2,2)$ by 1,000 ($= t^{u1}{}_{13}$) from Table 2. Clearly then if library Subcollection 3 (L_3) were located at (2,2), the same location as Market 1 of User Type 1, the cost would be zero.

It should be evident that the number of trips made by users to a library depend on the distance of the library from the users. Thus the trip matrix in general is a function of location and is not constant. Practically speaking, determining a trip matrix for every set of locations would involve immense difficulties in data collection and calculations. For this reason we have assumed that the trip matrix is constant. Thus whether L_1 is close or far, we assume a group of users at M_1 would make, for example, 1,000 trips annually to L_1. However, it is also assumed that the library user is rational and substitutes other ways of obtaining what the library provides if the traveling costs are too high. In particular, we assume that the library user refuses to incur costs in excess of the worth of the information.

Analysis of the Model: Locating a Centralized Library

If a campus is to have only one centralized library, it should be located where, for a given level of benefits, transportation costs are minimized. This location can be determined by adding the cost matrices for each user type at each market. Subcollections cannot be divided so there is but one total cost matrix for each user type at each market.

Table 3. Total Transportation Cost for Centralized Facility by Market and User Type

From M_1;		Assume M_1 at (2,2)								
User Type	Number of Trips	×	Cost Matrix			=	Total Cost Matrix			
1	1,750		1	1	1	3	1,750	1,750	1,750	5,250
			1	0	1	3	1,750	0	1,750	5,250
			1	1	1	3	1,750	1,750	1,750	5,250
2	1,500		1	1	1	2	1,500	1,500	1,500	3,000
			1	0	1	2	1,500	0	1,500	3,000
			1	1	1	2	1,500	1,500	1,500	3,000
From M_2;		Assume M_2 at (3,4)								
1	750		5	3	3	3	3,750	2,250	2,250	2,250
			5	3	1	1	3,750	2,250	750	750
			5	3	1	0	3,750	2,250	750	0
2	1,500		3	2	2	2	4,500	3,000	3,000	3,000
			3	2	1	1	4,500	3,000	1,500	1,500
			3	2	1	0	4,500	3,000	1,500	0

We shall continue our example using data from Tables 1 and 2. Type 1 users make a *total* of 1,750 (that is, 500 + 250 + 1,000) trips to the library, that is, all subcollections taken together, from M_1 (Market 1) and 750 (that is, 500 + 0 + 250) trips to the library from M_2 (Market 2). Similarly, Type 2 users make 1,500 trips to the library from M_1 and 1,500 trips from M_2. The total cost matrix is obtained by multiplying each element of the cost matrix by the total number of trips, as shown in Table 3.

The total cost for all users is then

$$\begin{bmatrix} 11{,}500 & 8{,}500 & 8{,}500 & 13{,}500 \\ 11{,}500 & 5{,}250 & 5{,}500 & 10{,}500 \\ 11{,}500 & 8{,}500 & 5{,}500 & 8{,}250 \end{bmatrix}$$

In this example, one location minimizes transportation costs. That one location is, of course, (2,2).

When the transportation rate structure is linear with distance, the center of gravity minimizes transportation costs; when the marginal cost of traveling increases with distance, the markets become more attractive as library locations.

The model allows an analysis of the effects of building new libraries. If, in the previous example, two libraries could have been built with identical collections, they would have been located at each market in order to minimize transportation costs. Yet this might be uneconomical where the number of users of each library differs greatly. One library's collection would be overused, the other's underused, and perhaps one library would be overcrowded while the other one was empty. There is a force toward dividing the trips and users (these may not be directly related) equally between the two. When there are more than two markets, it is possible to estimate which users will use each collection by assuming users will travel so as to minimize their transportation costs until the libraries are used about equally.

For example, assume that besides the total cost matrices for M_1 at (2,2) and M_2 at (3,4) the example included markets M_3 at (1,1) and M_4 at (1,3). The appropriate total cost matrices would be:†

Total cost for all users

$$M_1 \text{ at } (2,2) = \begin{bmatrix} 3{,}500 & 3{,}500 & 3{,}500 & 9{,}000 \\ 3{,}500 & 0 & 3{,}500 & 9{,}000 \\ 3{,}500 & 3{,}500 & 3{,}500 & 9{,}000 \end{bmatrix}$$

$$M_2 \text{ at } (3,4) = \begin{bmatrix} 9{,}500 & 6{,}000 & 6{,}000 & 6{,}000 \\ 9{,}500 & 6{,}000 & 2{,}500 & 2{,}500 \\ 9{,}500 & 6{,}000 & 2{,}500 & 0 \end{bmatrix}$$

$$M_3 \text{ at } (1,1) = \begin{bmatrix} 0 & 5{,}000 & 10{,}000 & 15{,}000 \\ 5{,}000 & 5{,}000 & 10{,}000 & 15{,}000 \\ 5{,}000 & 5{,}000 & 10{,}000 & 15{,}000 \end{bmatrix}$$

† These total cost matrices have not been derived from any previously given data. They were assumed in order to illustrate our point.

$$M_4 \text{ at } (1,3) = \begin{bmatrix} 5{,}000 & 1{,}000 & 0 & 1{,}000 \\ 5{,}000 & 1{,}000 & 1{,}000 & 1{,}000 \\ 5{,}000 & 1{,}000 & 1{,}000 & 1{,}000 \end{bmatrix}$$

Those at M_1 will use a library at (1,4), (2,4), or (3,4) only as a last resort, and will prefer the adjacent library which is least crowded. If two identical libraries are to be built, each set of feasible locations must be examined. Thus set I might include L at (3,3) and L′ at (2,2).

Those at M_1 would prefer (2,2), those at M_2, (3,3), those at M_3, (2,2), and those at M_4 would be indifferent as far as transportation considerations. Set II might be L at (1,1) and L′ at (2,3). For each possible set of library locations for L and L′, the users of each library and the total cost of transportation to users can be determined, as shown in Table 4.

Comparing these two possible sets of locations, Set II would be preferred by the library planners trying to minimize transportation costs.

The above analysis could also be applied to the case of adding an identical library to determine who would use it and the resulting savings in transportation costs. Thus if only L at (1,1) was operative, users from all four markets would use it at a total transportation cost of 18,000. Building L′ at (2,3) reduced these costs to 7,000, a saving of 11,000 cost units. Thus the benefits of building new libraries extend beyond the reduction of overcrowding and may be measured quantitatively.

In most cases, however, decentralizing the library means subdividing the collection and not building identical collections. Assume

$$T_1^u = \begin{bmatrix} 1{,}000 & 0 & 0 \\ 0 & 5{,}000 & 1{,}000 \end{bmatrix}$$

In T_1^u only those from M_1 use L_1, that is, Subcollection 1, and only those from M_2 use L_2 and L_3. Assuming no economies of scale, L_1 should be located at M_1, and both L_2 and L_3 at M_2 to minimize costs. Note that it makes no difference how far those at M_1 will be from L_2 and L_3 since they never use these libraries. Thus in the case of no crossover and no economies of scale decentralization is optimal.

Table 4a. Set I: L at (3,3) and L′ at (2,2)

Users at:	Library Used	Cost to Users
M_1	L′	0
M_2	L	2,500
M_3	L′	5,000
M_4	L	1,000
Total Transportation Cost		8,500

Table 4b. Set II: L at (1,1) and L′ at (2,3)

Users at:	Library Used	Cost to Users
M_1	L	3,500
M_2	L′	2,500
M_3	L	0
M_4	L′	1,000
Total Transportation Cost		7,000

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Now assume:

$$T_2^u = \begin{bmatrix} 1{,}500 & 500 & 1{,}500 \\ 1{,}000 & 1{,}000 & 500 \end{bmatrix}$$

The case for decentralization is not easily made. Since crossover exists (for example, those at M_1 sometimes must travel to L_2 or L_3), the cost of these excursions and thus the distance between M_1 and L_2 and L_3 becomes a factor. This is handled adequately by the model discussed above.

For each market, the cost of traveling to each possible location of the three libraries is found as before by multiplying the number of trips to each library by the cost matrix. For each library, then, the total cost matrices are summed to determine the total transportation cost for each possible location of that library.

An Example

Given the trip matrix for User Type u_2

$$T_2^{u_2} = \begin{bmatrix} 1{,}500 & 500 & 1{,}500 \\ 1{,}000 & 1{,}000 & 500 \end{bmatrix}$$

and given the fact that Market 1 is located at (2,2) while Market 2 is located at (3,4), then cost matrices are respectively:

$$C^u(2,2) = \begin{bmatrix} 1 & 1 & 1 & 3 \\ 1 & 0 & 1 & 3 \\ 1 & 1 & 1 & 3 \end{bmatrix}$$

$$C^u(3,4) = \begin{bmatrix} 5 & 3 & 3 & 3 \\ 5 & 3 & 1 & 1 \\ 5 & 3 & 1 & 0 \end{bmatrix}$$

From the above data:

From M_1 trips to

$L_1 = 1{,}500$, Cost for $L_1 =$

1,500	1,500	1,500	4,500
1,500	0	1,500	4,500
1,500	1,500	1,500	4,500

$L_2 = 500$, Cost for $L_2 =$

500	500	500	1,500
500	0	500	1,500
500	500	500	1,500

$L_3 = 1{,}500$, Cost for $L_3 =$

1,500	1,500	1,500	4,500
1,500	0	1,500	4,500
1,500	1,500	1,500	4,500

From M_2, trips to

$L_1 = 1{,}000$, Cost for $L_1 =$

5,000	3,000	3,000	3,000
5,000	3,000	1,000	1,000
5,000	3,000	1,000	0

$L_2 = 1{,}000$, Cost for $L_2 =$

5,000	3,000	3,000	3,000
5,000	3,000	1,000	1,000
5,000	3,000	1,000	0

$L_3 = 500$, Cost for $L_3 =$

2,500	1,500	1,500	1,500
2,500	1,500	500	500
2,500	1,500	500	0

Summing the two matrices for each L_1:

Total cost for L_1 Sum $=$

6,500	4,500	4,500	7,500
6,500	3,000	2,500	5,500
6,500	4,500	2,500	4,500

Total cost for L_2 Sum $=$

5,500	3,500	3,500	4,500
5,500	3,000	1,500	2,500
5,500	3,500	1,500	1,500

Total cost for L_3 Sum $=$

4,000	3,000	3,000	6,000
4,000	1,500	2,000	5,000
4,000	3,000	2,000	4,500

If there were no economies of scale, L_1 should be located at (2,3) or (3,3), L_2 at (3,4), (2,3), or (3,3), and L_3 at (2,2) to minimize transportation costs.

Economies of scale, however, may make minimizing transportation costs a less than optimal solution. For example, if L_1 were built at (2,3), L_2 at (3,4), and L_3 at (2,2) the total cost of transportation would equal (2,500 + 1,500 + 1,500) or 5,500 cost units. If L_1 were built at (2,2), thus combined with L_3, the total transportation cost would rise 500 units to 6,000 cost units. Would combining L_1 and L_3 be an optimal solution? Without economies of scale it would not, but with such economies (that is, cost savings in building and operating due to increased size), the question becomes one of the magnitude of such savings.

A Further Application: The Complete M.I.T. Library System

As noted below, the data necessary for a complete location analysis relevant to current M.I.T. library planning are not now available. This discussion is thus limited to specifying the information that is required and further illustrating the value of location analysis.

Figure 1 is the trip matrix which cannot now be filled with the necessary data. The libraries are divided into three sections, study hall, reserve and required reading, and research. This division allows for the separate consideration of the centralization of each part of the library. This is suggested because of the apparent differences in the economies of scale among the three divisions (moderate economies for study halls, small, if any, for reserve and research), and the probable differences in user transportation behavior among the three sections (given the cyclical nature of research and required reading and the use of study halls between classes). For example, it is hypothesized that research work is specific to a given library collection and allows for little substitution by purchasing books at the Coop (M.I.T.'s campus bookstore) or consolidating trips, while the use of a specific study hall would be very sensitive to transportation costs. If this were true, then for the former it would be possible to assume an "inelastic" trip matrix, while the latter implies an "elastic" trip matrix. The above hypothesis could be partially tested by determining if a given library branch tended to be used as a study hall by those with the closest origins.

To separate these three functions of the library, users could be asked to indicate their purpose for each trip to the library. Where more than one purpose is indicated, the purposes may be placed in some hierarchical order. Research in a specific library usually does not have a substitute, required reading may be postponed or curtailed, and studying may be done at many convenient locations on campus. Thus, where motives are reported as mixed, the more restrictive motive could be assumed. (There are al-

Figure 1. Trip Matrix for M.I.T. Library System

Origins	Research $L_1 L_2 L_3 L_4 L_5 L_6 L_7$	Study Hall $L_8 L_9 L_{10} L_{11} L_{12} L_{13} L_{14} L_{15}$	Reserve $L_{16} L_{17} L_{18} L_{19} L_{20} L_{21} L_{22}$
Dorms			
M_1			
M_2			
M_3			
M_4			
M_5			
Classes, Offices			
M_6			
M_7			
M_8			
M_9			
M_{10}			
M_{11}			
M_{12}			
M_{13}			
Arrival Points on Campus (Mass Transit)			
M_{14}			
M_{15}			

ternative ways of analyzing these responses, but *a priori* this appears the most fruitful.) The remainder of the information would include:

1. Origin of the trip to library (campus building or its approximate location, home, or transit stop).
2. Background information—user's status, department.
3. Library information—specific library, day, time that individual entered.
4. Next destination, if known (is library a convenient or inconvenient stopping off point?).

This type of survey has been done (in less specific terms) by Bush, Gallanter, and Morse in 1956 for the Science Library at M.I.T. *(4)*. It is feasible and could be easily attached to a general user survey, which might include questions about user behavior while in the library. The number of times a user is not satisfied and must go to another library could also be determined. Given the requirement for data about each of the libraries and for relatively infrequent users, samples would have to be taken periodically, at different hours on different days, for each library.

Rather than assume a trip matrix and develop an analysis as above, a simplified example illustrates the great impact of the factor termed crossover, the degree to which those at one market or point of origin use libraries at more than one location. Assume students make 1,000,000 trips to the library annually and faculty 100,000; students walk at a rate of 4 m.p.h. and faculty at 3 m.p.h.; one distance unit equals 0.1 mile. The cases can now be analyzed as in Table 5.

Case A—Assume high crossover where 25% of the student and 10% of the faculty trips average 2 units in length, the remainder, 1 unit.

Case B—Assume a completely centralized library where the average trip is 1½ units. (In reality, the averages should all be weighted, probably by a rate structure reflecting increasing marginal cost as distance traveled increases.)

Case C—Assume low crossover where 10% of the student and none of the faculty trips average 2 units, the remainder, 1 unit.

Table 5. Analysis of the Effect of "Crossover"

Case	User Type	Units Traversed	Miles per Unit	Miles per Hour	$/hr.	Approximate Cost	Total Cost
A	Students	1,250,000	0.1	4	$ 5	$156,000	$193,000
	Faculty	110,000	0.1	3	10	37,000	
B	Students	1,500,000	0.1	4	5	188,000	238,000
	Faculty	150,000	0.1	3	10	50,000	
C	Students	1,100,000	0.1	4	5	138,000	171,000
	Faculty	100,000	0.1	3	10	33,000	

In this illustration three special cases have been examined; in a complete analysis all possible locations are carried through the analysis. Substituting a centralized library (Case B) for the high crossover (Case A) costs not $238,000 but ($238,000 — $193,000) or $45,000 more. Economies of scale, however, may offset the added transportation costs, though it is our opinion that real economies of scale are probably not very large.

The decision to centralize thus depends upon the amount of crossover in alternative systems and economies of scale. Location analysis provides a framework within which to combine these elements. The assumptions which must be made for such an analysis, pertaining to the linearity and absolute level of transportation rate structures, may be partially tested. At worse, such an analysis could change the problem from one of coping with general impressions to one of making some quantitative determinations.

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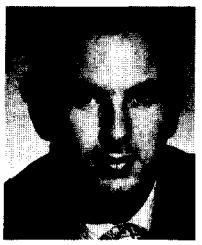

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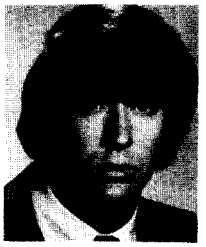

SHISHKO

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Library of Congress Proof Slips

The Overlooked Selection Medium for Business Libraries

Elizabeth Casellas

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■ Library of Congress proof slips are created when copy for new catalog cards is run on long sheets, five cards at a time. Complete or partial sets of these sheets are available by broad subject category. The results of a survey of sample business libraries show only a small percentage using proof slips for selection although they represent the most comprehensive bibliography available, afford specialization, and necessary cataloging information. Advantages and disadvantages in the use of proof slips, problems with traditional selection media, the use of non-library specialists, and foreign materials in U.S. business libraries are also analyzed.

LIBRARY OF CONGRESS proof slips are created when copy for new catalog cards is run on long sheets, five cards at a time. Complete or partial sets of these sheets are available by broad subject category.

The total output by LC for the following schedules during FY 1971 is estimated as follows:

Social and Political Sciences (H & J combined)	5,702
Science (Q)	2,810
Technology (T)	2,834
Bibliography (Z)	858
Total	12,204

About 98% of all business subjects fall into these 4 schedules. The remaining 2% fall chiefly in the following schedules:

Law (K)
Philosophy-Religion (B)
Agriculture (S)

The results of a survey of 177 sample business libraries with 46% returning the questionnaire and 2% reporting no business library indicate that only 9% of the sample uses LC proof slips. University business libraries exceed special libraries in their use by 2:1 and exceed public libraries by approximately 3:1 (see Table 1).

The largest number of libraries using LC proof slips is in New York State and east of the Mississippi. About 90% of the libraries have a more than $5,000 book budget; about 67% have more than 5 on the staff and 50% do not route the slips to faculty, specialists or

executives *(1)*. This reflects the emphasis from faculty (or executive)-directed to library-directed book selection *(2)*.

All Business Libraries Using LC Proof Slips

Geographical Breakdown

California	2
Hawaii	1
Indiana	2
Illinois	1
Louisiana	1
New York	5
Ohio	1
Pennsylvania	2
New Mexico	1
East of Mississippi	7
West	4
North Central	4
South	1

Budget

Over $50,000	3 libraries
$40–50,000	2 libraries
$30–40,000	2 libraries
$20–30,000	3 libraries
$10–20,000	4 libraries
$ 5–10,000	2 libraries

Staff

Over 20	1 library
15–20	0 library
10–15	3 libraries
5–10	7 libraries
1–5	5 libraries

Routing to Faculty, Specialists, Executives

No	8 libraries
Yes	5 libraries (1 of these routes to specialists within the library)
No answer	3 libraries

Of the 8 libraries which do not route, 3 report high use of the proof slips, 2 report medium use and 3 low use. Of the 6 libraries which route, 5 report high use and 1 medium use. 2 did not answer.

Table 1. Total in Sample

Type	Response Using LC Proof Slips	Response Not Using LC Proof Slips	Response No Bus. Libr.	No Response	Total
Special	4	40	1	57	102
University	9	11	3	17	40
Public	3	14	0	18	35
All Types	16	65	4	92	177

Other Selection Media Used by Libraries Using LC Proof Slips

High Use	*No. of Libraries*
Library and book trade periodicals	7
Trade and professional journals	5
U.S. government bibliographic aids	10
Publishers' announcements	8
Publishers' catalogs	0
Trade bibliographies	4
Book review cumulations	1

Low Use	*No. of Libraries*
Library and book trade periodicals	1
Trade and professional journals	3
U.S. government bibliographic aids	3
Publishers' announcements	2
Library acquisitions lists	5
Publishers' catalogs	5
Trade bibliographies	2
Book review cumulations	3

Never Use	*No. of Libraries*
Trade and professional journals	1
Trade bibliographies	2
Library acquisitions lists	1
Book review cumulations	3

Languages Used by Libraries Using LC Proof Slips

University

Spanish, French and German tied for first place in frequency of use. Least used was Russian. Infrequency of foreign languages in collection exceeded frequency of use by a ratio of 5:2 for Spanish, French and German and 7:2 for Russian.

Special Libraries (Firm or Association)

None of the reporting libraries using LC proof slips indicated frequency of foreign languages in the collection.

Public Libraries

Only three libraries responded in the survey, of which one reported frequency in collection.

Selection Media Most Frequently Used by All Types of Business Libraries Not Using LC Proof Slips Was in the Following Order for the 65 Responding Libraries:

Trade and professional journals	35
U.S. government bibliographic aids	35
Library and book trade journals	33

Selection Media Least Frequently Used by All Types of Business Libraries Not Using LC Proof Slips Was in the Following order:

Book review cumulations	31
Trade bibliographies	9

Selection Media Used by All Types of Business Libraries Not Using LC Proof Slips

Media	*High*	*Medium*	*Low*	*Not Used*
Library and book trade periodicals	33	15	14	2
Trade and professional journals	35	18	9	1
U.S. government bibliographic aids	35	16	10	3
Publishers' announcements	19	27	16	2
Library acquisitions lists	21	18	18	7
Publishers' catalogs	7	20	30	7
Trade bibliographies	11	22	22	9
Book review cumulations	8	8	17	31

Selection Media Used by University Business Libraries Not Using LC Proof Slips

Trade and professional journals received first place for high frequency of use, while library and book trade periodicals came second. The least used medium was book review cumulations.

Media	*High*	*Medium*	*Low*	*Not Used*
Library and book trade periodicals	5	4	1	1
Trade and professional journals	6	3	2	0
U.S. government bibliographic aids	4	3	3	1
Publishers' announcements	3	5	3	0
Library acquisitions lists	4	0	5	2
Publishers' catalogs	1	3	5	2
Trade bibliographies	2	3	2	4
Book review cumulations	0	1	5	5

Selection Media Used by Public Business Libraries Not Using LC Proof Slips

Trade and professional journals were used most frequently, with 13 out of 14 votes. U.S. government bibliographic aids and publishers' announcements tied for second place.

Media	*High*	*Medium*	*Low*	*Not Used*
Library and book trade periodicals	13	1	0	0
Trade and professional journals	4	4	6	0
U.S. government bibliographic aids	5	4	5	0
Publishers' announcements	5	6	3	0
Library acquisitions lists	2	3	6	3
Publishers' catalogs	2	2	10	0
Trade bibliographies	4	5	5	0
Book review cumulations	5	5	2	2

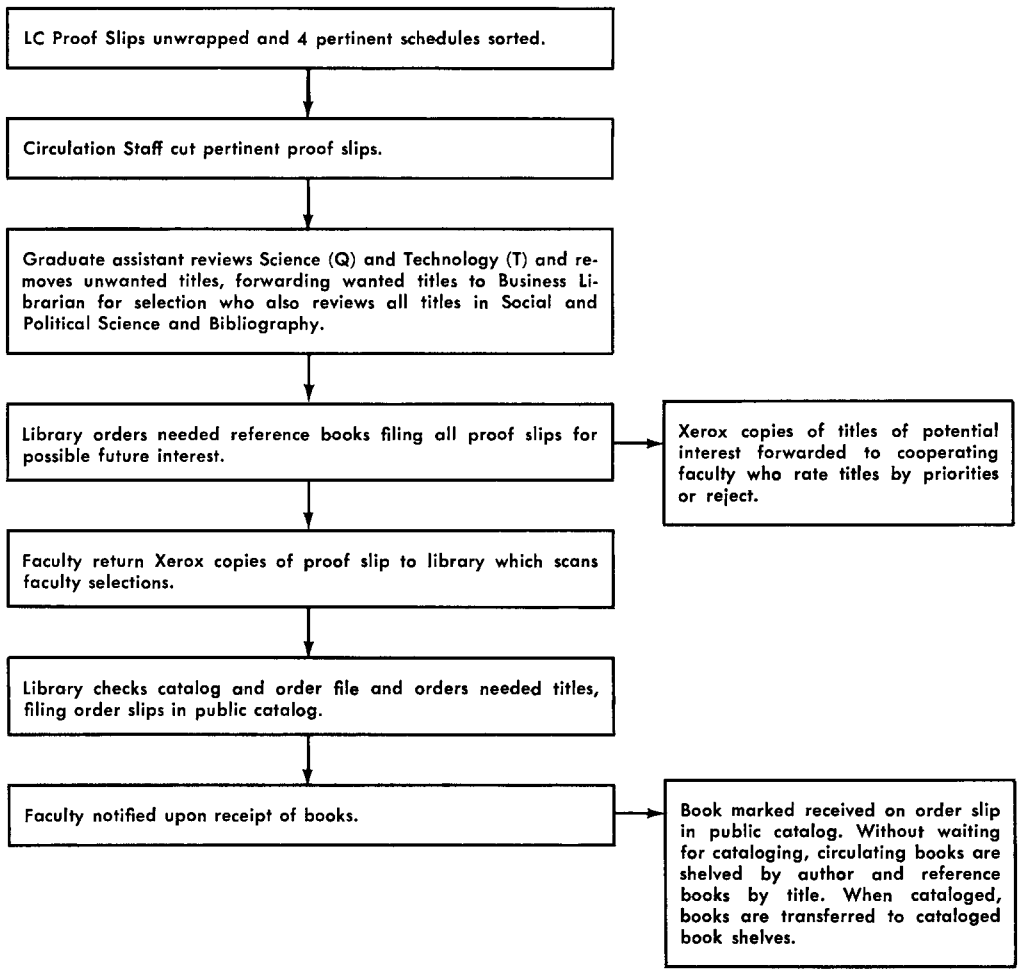
Selection Media Used by All Special Business Libraries Not Using LC Proof Slips

U.S. government bibliographic aids received first place, getting 26 votes for high frequency use. Library and book trade periodicals tied for second place with library acquisitions lists, receiving 15 votes each. The least used medium was book review cumulations with 24 votes.

Media	*High*	*Medium*	*Low*	*Not Used*
Library and book trade periodicals	15	10	13	1
Trade and professional journals	25	11	1	1
U.S. government bibliographic aids	26	9	2	2
Publishers' announcements	11	16	10	2
Library acquisitions lists	15	15	7	2
Publishers' catalogs	4	15	15	5
Trade bibliographies	5	14	15	5
Book review cumulations	3	2	10	24

Library of Congress proof slips have become the primary tool used in book, U.S. government and monograph selection at the Norman Mayer Library, Graduate School of Business Administration, Tulane University, because they represent the most comprehensive bibliography available and provide the information necessary for quickly cataloging books and documents. Library staff and teaching faculty continue to examine other selection tools. As many serials as possible, especially conference proceedings, are placed on standing order because of the slowness in LC cataloging *(3)*.

Flow Chart for Use of LC Proof Slips for Selection of Books and Monographs



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In the Norman Mayer Library, approximately 25% of all 12,200 business titles in the four major schedules are retained for consideration: 10% are immediately selected by the library, chiefly for reference collection; and 15% are routed to faculty. Faculty reject about 51% of all titles routed to them, chiefly because of language. Approximately 75% of titles retained are filed for possible cataloging of gifts, future orders and analytics for serials already held or to be acquired. The proof slips do not include cataloging done by cooperating libraries other than LC. For example, most of the University of Michigan business studies are not available on the proof slips since these are chiefly cataloged by that university, rather than LC.

Cost Factors in Using LC Proof Slips *(4)*

Subscription rate for complete sets (uncut) per year	$250.00
Subscription rate for complete sets (cut and punched) per year	385.00

Subscription rate for partial sets	0.15 per sheet
Service charge for cutting and punching partial sets, per month, per class	1.50

If bought on a partial basis, the most frequently used schedule—Social and Political Sciences—would be $855.30 for 5,702 titles instead of $250.00 for the entire set. Proof slips are not available for separate parts of any class. The four schedules of interest to business would be $1,829.60 on the individual basis.

Approximately 40 hours per week are needed to cut into catalog card size all four schedules. This can be eliminated by buying cut and punched proof slips. Some libraries prefer to cut only needed titles to reduce the cutting time, but this does impose more work on the librarian.

Filing the proof slips in the four schedules takes about 6 hours per week.

Selection time requires about 10 hours per week for the professional, plus time of faculty or specialists.

The figure may vary according to how many schedules are inspected. Martin *(5)* reports 2 hours per week for a professional and 5 hours for nonprofessional time per week.

Reasons for Resistance to Use of LC Proof Slips for Selection

1. Belief that it is desirable to examine a book or to read one or more reviews before selecting.
2. Small budgets do not warrant the expense of proof slips.
3. Emphasis on non-book materials, such as market or media studies, which are not frequently or quickly enough cataloged by LC.
4. Smaller special libraries are not always fully cataloged, especially when collection is chiefly on one topic.
5. Unfamiliarity with proof slips.
6. Lack of clerical help to maintain proof slips.
7. Fear of trying the unknown and unfamiliar.

Disadvantages of Using Traditional Review Media Over LC Proof Slips

1. Afford smaller publishing output. In 1965 *Publishers Weekly* listed 28,595 titles and new editions, while LC had a total of nearly 85,000 proof slips.
2. Some review media have titles listed alphabetically by main entry, such as *PW,* others by broad topic such as *Library Journal,* while professional or technical journals may have titles scattered throughout the publications.
3. Some titles are frequently listed in several media while other titles are omitted.
4. Review media are in varying format, and often a single page to an entire journal; thus becoming difficult to use.

Evaluation of LC Proof Slips

Library of Congress proof slips are highly recommended for business libraries that can afford to buy proof slips, provide about 10 hours per week professional time and a minimum of 6 hours clerical time.

While about 12% report book and other library materials budgets under $10,000, about 50% of the libraries using the proof slips have between $20,000 and $40,000. Nearly 80% of the libraries using LC have 5 or more staff members.

For the academic libraries concerned with selecting not individual books but books in quantity *(6),* or for the larger special library, the use of the LC proof slips seems necessary. For smaller special libraries, a careful investigation of the pros and cons of the proof slips might result in a great improvement of the business collection.

All business libraries have two common characteristics: 1) A need for an intensively specialized collection, and 2) the problem of locating specialized materials out of literally thousands of titles of no relevance. Library of Congress proof slips may be the answer to a long unsolved problem.

A Partial List of Business Libraries Using LC Proof Slips

Special Libraries (Firm or Association)

Lionel D. Edie and Company, Inc., New York
Federal Reserve Bank of Philadelphia
Federal Reserve Bank of San Francisco
General Electric Company, Schenectady, New York

*University Libraries**

University of California, Los Angeles. Graduate School of Business Administration. Library.
Cornell University. Graduate School of Public Administration. Library. Ithaca, New York.
University of Hawaii. Thomas Hale Hamilton Library. Honolulu.
University of Illinois. Commerce Library. Urbana, Illinois.
Indiana University. Business Library. Bloomington, Indiana.
Ohio State University. Commerce Library. Columbus, Ohio.
University of Pittsburgh. Graduate School of Business Administration. Library.
University of New Mexico. Parish Memorial Library. Albuquerque, New Mexico.
Tulane University, Graduate School of Business Administration. Norman Mayer Library. New Orleans, Louisiana.

Public Libraries

Buffalo and Erie County Public Library. Buffalo, New York.
Indianapolis-Marion County Public Library. Business Library. Indianapolis, Indiana.
New York Public Library. Economics Division.

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* Received too late to be included in the survey were: the J. Hugh Jackson Library of Stanford University, Graduate School of Business, which reported high use of LC proof slips and the Baker Library of the Harvard University Business School which reported medium use of LC proof slips.

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sla news

Do You Give a Damn?

The Nominating Committee for 1972/73 earnestly seeks help from every member of the Association in its search for the best qualified candidates to represent you as future officers. Do you care enough about the future of your Association to take just a few moments to help us with this important responsibility?

We need your recommendations for those members who are most knowledgeable of all phases of Association activity, those who have shown a dedication to the aims and ideals of the Association, who are representative of its diversified professional interests and various geographical areas, and who would be willing and able to accept nomination.

Please submit suggested names by letter with a brief note giving qualifications. These should be sent as soon as possible and prior to the Boston Conference, June 4–8, 1972.

Candidates are needed for the offices of President-Elect, Chairman-Elect of the Advisory Council, two members of the Board of Directors (3 year term), and Treasurer. Your carefully considered suggestions will be very much appreciated. Send recommendations to the Chairman of the Nominating Committee: Lorna M. Daniells, Baker Library, Harvard Business School, Soldiers Field, Boston, Mass. 02163.

James Humphry, III
Burton E. Lamkin
Aphrodite Mamoulides
Eileen B. Morash
Lorna M. Daniells, Chairman

Ferguson Communications Award Deadline Extended

The deadline for entries for the first Ferguson Communications Award has been extended to Apr 15 (from Feb 15) to permit wider circulation of rules and to encourage every Special Libraries Association member to participate. (Full regulations appear in *Special Libraries,* September 1971, p.375.)

The newly devised Ferguson Communications Award is a program which hopes to encourage innovative ways of communicating the special library's uses and value to its clientele. While the services of the library always "tell it like it is," the award program seeks to draw messages that are loud, clear, *new* and repeatable.

Entries are welcome from any Special Libraries Association member, on an individual basis, not group. There are two categories in which they will be judged: 1) written, 2) audio-visual.

Prize money will be awarded to the top three entries in each category: $300 for first, $200 for second and $100 for third.

Submit all entries to: Lucille Gordon, librarian, Institute of Life Insurance, 277 Park Ave., N.Y. 10017.

CHAPTERS & DIVISIONS

Cincinnati—The Chapter's Oct 14 meeting was held at Miami University, Oxford, Ohio. Dr. Charles Churchwell discussed the program for establishing a curriculum for library assistants at Miami University. Jack Daugherty, Department of Educational Media, explained that department's program which leads students through a technical library and liberal arts program to prepare to become school media specialists.

Lt. Jim Stanley of the Cincinnati Police Department spoke to the Chapter on Nov 16. He detailed the Department's efforts toward crime and accident prevention.

Colorado—The "Library in the Year 2000" is the theme of the Fourth Joint Colloquium of the Colorado and Rio Grande Chapters to be held May 5–7, 1972 at Sanborn's High Trails Ranch in Florissant, Colorado. Registration fee is $40, including six meals and two nights' accommodations.

Dayton—The Chapter met Dec 3 for a meeting devoted to "The OSU On-line Remote Access Catalog and Circulation System."

Paul Hadinger, head of research at Citizens Research, Inc., discussed "Planned Programming Budgeting System" (PPBS) at the Jan 28 dinner meeting.

Florida—The Chapter sponsored an "Institute on Managing the Special Library" on Dec 4. The sessions were held at Florida Technological University; instructors were Dr. Martha Jane Zachert and Martin F. Meltzer.

New Jersey—The Chapter's Jan 17 meeting was devoted to "Patents: U.S. and Foreign." Speakers were Miss Brereton Sturtevant, Examiner-in-Chief, U.S. Patent Office Board of Appeals, and Dr. Lester Horwitz, partner, Ladas, Parry, Von Gehr, Goldsmith & Deschamps. The discussion included nature of a patent, patent classification systems, securing copies of patents, differences between U.S. and foreign patent systems, equivalency check, types of patent searches and tools for patent searching.

The Chapter's first Annual Scholarship Event was held Dec 3 in the Student Lounge at the Rutgers Graduate School of Library Service, New Brunswick. The cheese and wine tasting party was held jointly with the Princeton-Trenton Chapter. A net of $225.76 was realized for the Scholarship Fund.

New York, Newspaper & News Group, Picture Group—Supreme Equipment and Systems Corporation sponsored a film and a brief discussion of information retrieval equipment at a Jan 12 meeting.

New York, Technical Sciences Group, Documentation Group—Scott Adams, special assistant for UNISIST, Office of the Foreign Secretary, National Academy of Sciences, addressed the Jan 20 meeting. His topic was "UNISIST—A World-Wide Information System: Its Development and Plans."

Public Utilities—The Division contributed $100 to the Association Scholarship Fund. A project is also underway towards inaugurating the annual sponsorship of a library science school student(s) to the SLA Annual Conference.

The Division's 2d edition of *A Union List of Serials for Public Utility Libraries* is available for $10.00 prepaid from Anne Burnett, librarian, Pacific Gas & Electric Company, 245 Market St., San Francisco, Calif. 94106.

Southern California—A membership meeting was held Jan 25. A panel of members discussed "What SLA Can Do for You."

Virginia—The Chapter's Dec 4 meeting was held in Williamsburg at the same time as the Virginia Library Association. Fred Glazer, director of the Chesapeake Public Library, and Mrs. Buth Belk, Colonial Williamsburg Research Library discussed "Public Relations" with a panel of Chapter members.

Washington, D.C.—The Chapter helped sponsor a buffet and reception Nov 15 in honor of the National Commission on Libraries and Information Science. Over 300 attended the reception at the University Club to welcome the members of the Commission.

Wisconsin—W. Lyle Eberhart, assistant superintendent, Division for Library Services, State of Wisconsin, Department of Public Instruction, spoke to the Chapter Sep 14. His topic was "Knowledge Network of Wisconsin," particularly in relation to the state agency.

MEMBERS IN THE NEWS

James C. Andrews, formerly university librarian, University of Texas at Dallas . . . appointed director of libraries, Rensselaer Polytechnic Institute, Troy, N.Y. to replace **Edward A. Chapman,** now librarian emeritus.

Alice D. Ball (executive director, U.S. Book Exchange) . . . was awarded Honorary Degree of Doctor of Humane Letters by Chungang University in Seoul, Korea. The degree was "in recognition of her distinguished contribution to the international library movement and the promotion of friendship between the peoples of Korea and the United States of America."

George Barlow, former director of editorial research, Cowles Communications, *Look* Magazine . . . is now library manager, Standard & Poor's Corp., N.Y.

Joan Baurer, formerly librarian, Radiation, Inc., Melbourne, Florida . . . to librarian, Georgia Power Company, Atlanta.

Joseph M. Dagnese . . . accepted appointment as director, Libraries and Audio-Visual Center, Purdue University, Lafayette, Indiana. He had been assistant director of libraries for technical services at Massachusetts Institute of Technology since 1966.

Kenneth H. Fagerhaugh . . . appointed director of university libraries, Carnegie-Mellon University, Pittsburgh, Pa. He had been head librarian at the university's Hunt Library since 1952.

Alan Fern, assistant chief, Prints and Photographs Division, Library of Congress . . . gave an illustrated lecture on "Expanding Limits of the Print" at the annual meeting of the Mid-America College Art Association at Bowling Green State University, Ohio.

Members of the Montreal Chapter who have retired recently are **Sybil Grimson** (Atwater Library, Montreal), **Edna Hunt** (National Science Library, Ottawa), **Louise Lefebvre** (Pulp and Paper Research Institute of Canada Library, Pointe Claire, Quebec), **Phebe Prowse** (Montreal Children's Hospital Library) and **Evelyn Campbell** (Nova Scotia Research Foundation Library).

Irving M. Klempener, professor of library and information science, State University of New York at Albany . . . received an award from ASIS for his publication, *Audio-Visual Materials in Support of Information Science Curricula,* published by ERIC/CLIS.

Robert B. Lane, formerly chief of reader services, Air University Library, Maxwell Air Force Base, Alabama . . . appointed field director of the PL-480 office in Karachi, Pakistan.

George Lowry, former assistant head of acquisitions, Columbia University Library, N.Y. . . . is now librarian, International Affairs Library, at the University.

Dr. Vern M. Pings . . . named director of university libraries, Wayne State University, Detroit, Mich. He had been acting director of university libraries since August and medical librarian at the university medical library since 1961.

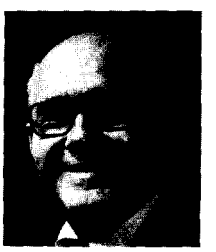
Jack R. Ponischil, formerly reference-bibliographer, Stilwell Library, Cleveland State University, Cleveland, Ohio . . . appointed head, reference department, New York Academy of Medicine Library.

Eleanor Radwan, New York Public Library Branch System . . . appointed head, General Reference Services, Mid-Manhattan Library, N.Y.

Catherine D. Scott (head librarian, Bellcomm Inc., Washington, D.C.) . . . named vice-chairman of the National Commission on Libraries and Information Science.

Joel Robert Siegfried . . . appointed assistant city librarian, City of National City, California. He has just returned from Scandinavia where he studied Nordic Public Library Service under fellowship support by the American-Scandinavian Foundation.

Karen Story . . . retired from Honeywell Information Systems Technical Library, Waltham, Mass.



STRABLE

Edward G. Strable . . . elected a vice-president of J. Walter Thompson Co., Chicago.

SLA Authors

Alexander, Gerard L. *Guide to Atlases: World, Regional, National, Thematic*—An International Listing of Atlases Published Since 1950. Metuchen, N.J., Scarecrow Press, 1971. 671p. $17.50.

Anderson, Frank J. *Sixteenth Century Imprints,* Spartanburg, Wofford Library Press, 1971. pap. 39p. (Special Collections Checklist No. 7)

Carrington, David K. and Elizabeth I. Mangan, comps. *Data Preparation Manual for the Conversion of Map Cataloging Records to Machine-Readable Form.* 1971. v,317p. (Avail. Supt. Docs., U.S. Gov. Printing Office, Wash., D.C. 20402; $2.75)

Casellas, Elizabeth. "Largest Business Library in the South: The Tulane Graduate School of Business Administration Library." Louisiana Library Association *Bulletin* 34 (no.3): (Fall 1971). (Reprint avail. from Elizabeth Casellas, Tulane Univ., Grad. Sch. of Bus. Admin., New Orleans, La. 70118)

Connor, John M. and **Billie M. Connor.** *Ottemiller's Index to Plays in Collections:* An Author and Title Index to Plays Appearing in Collections Published Between 1900 and Mid-1970, 5th ed. Metuchen, N.J., Scarecrow Press, Inc., 1971. 452p. $11.00.

Conroy, Barbara. *A Descriptive and Evaluative Report of the Washington Seminar:* Library Career Development Institute. An institute conducted at Catholic University of America, Washington, D.C., Department of Library Science, under a grant from U.S.O.E. Washington, D.C., The Catholic University of America, July 1971.

Hanson, Peter P. "Silver Halide Photographic Systems—A Bibliography of Reviews (1969–1970)." *Photographic Science and Engineering* 15 (no.6): p.501–509 (Nov-Dec 1971)

Matarazzo, James. *Library Problems in Science and Technology.* New York, R. R. Bowker Co., 1971. 167p. $9.95.

John Cotton Dana Lectures 1971/72

At the School of Library and Information Science at the University of Western Ontario, Zoe Cosgrove presented a John Cotton Dana Lecture on Mar 8.

Mark Baer lectured at the Graduate School of Library Studies, University of Hawaii, also on Mar 8. He will lecture at the University of Oregon Apr 3.

Kathleen Taylor lectured Mar 9 at the School of Library Science, University of Alberta. She will also lecture at Brigham Young University.

Mrs. Audrey Grosch presented lectures Mar 20 at the Department of Library Science, Northern Illinois University, and Mar 22 at the School of Library and Information Science, University of Missouri.

SLA Employment Clearinghouse at Conference

The SLA Employment Clearinghouse will be available to SLA members and to employers registered at the Conference in Boston. The Clearinghouse will be open Sun., Jun 4 (1–4 p.m.); Mon., Jun 5 (9 a.m.–5 p.m.); Tue., Jun 6 (9 a.m.–5 p.m.); Wed., Jun 7 (Noon–4:30 p.m.).

Résumé forms for members can be obtained from the Membership Department, Special Libraries Association, 235 Park Avenue South, New York, N.Y. 10003. The completed résumé forms must be returned by May 26. The Clearinghouse will arrange interviews at the Conference.

Employers with vacancies may request a "Job Opening" form from the same address as above; the deadline for their submission is also May 26. Job descriptions for the vacancies will be posted at the Clearinghouse.

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Copyright Infringement

On February 16, Commissioner Davis of the U.S. Court of Claims ruled against the U.S. government in the long-pending copyright infringement case of *Williams & Wilkins Co.* v. *United States.* Basis for the action was allegation of infringement against the library of the National Institute of Health and the National Library of Medicine for excessive photocopying of *Williams & Wilkins'* periodicals so as to infer substantial loss of subscriptions revenue to the publisher. Suit was for compensatory damages under 28 U.S.C. s.1498 providing for recovery in infringement actions where agencies of the federal government are at fault. Among the government's various defenses was the argument that this photocopying did not exceed "fair use," an argument that did not persuade the Commissioner: "Defendant's photocopying is wholesale copying and meets none of the criteria for 'fair use.'" The Commissioner suggested that a solution to the problem lies either in some sort of legislative exception to "multiple copying for research," or in a licensing authority which would collect a user-fee from copiers or copier manufacturers. If adopted by the Court of Claims and sustained on appeal to the Supreme Court, this decision could have important ramifications for all libraries using copier equipment. It is expected that the case will be appealed. Before decision, amicus briefs were filed on the government side by several major library associations including the American Library Association, the Association of Research Libraries, Medical Library Association and the American Association of Law Libraries. In 1970 the SLA Board of Directors had voted to enter the suit as amicus curiae with the American Library Association. Copies of the Court of Claims opinion are available for $3.95 from Dataflow Systems Inc., 7758 Wisconsin Ave., Bethesda, Md. 20014.

J. S. Ellenberger
Chairman,
SLA Special Committee on
Copyright Law Revision

HAVE YOU HEARD ?

Reading Machine for Partially Sighted

The Pasadena Public Library has acquired a "reading machine" for use in the library by all who have impaired vision. It was donated by the Pasadena Lions Club. The machine, marketed as Read/Write System by Visualtek, Santa Monica, Calif., is a closed-circuit TV system. It magnifies up to 30×, provides increased contrast of the letters, and reversed ("negative") images.

Ei Microfilm Index

Engineering Index, Inc. (Ei) has introduced *Subject Heading Index to the Microfilm Edition of the Ei Annual.* The index, available without charge to Ei microfilm users, reflects subject headings and "see" references.

Audio-Visual Equipment

The revised 1972/73 *Audio-Visual Equipment Directory* (18th ed.) was scheduled to be available from the National Audio-Visual Association in mid-February. The directory lists and pictures each entry in addition to several other features. The 470 page publication is available to those not commercially engaged in the A-V industry for $9.25 ($8.25 if payment accompanies order). Orders to NAVA, 3150 Spring St., Fairfax, Va. 22030.

Information Retrieval Proceedings

The proceedings of the 8th Annual National Information Retrieval Colloquium held in Philadelphia, May 6–7, 1971, are now available as the Jan 1972 issue of the *Drexel Library Quarterly.* The issue may be obtained for $3.00 from the *Drexel Library Quarterly,* Graduate School of Library Science, Drexel University, Philadelphia, Pa. 19104.

Automated Library Activities

The Library Automation, Research & Consulting (LARC) Association is publish-

ing a 12-volume series titled *A Survey of Automated Activities in the Libraries of the World.* The publication is the result of a library-by-library survey and is compiled by Frank S. Patrinostro. Prepaid orders for the entire series are $150.00; separately, vol. 1 is $10.00, vols. 2-12 are $15.00 each. The LARC Association, P.O. Box 27235, Tempe, Arizona 85282.

Continuing Education for Librarians

Pratt Institute, The Open School in Manhattan, began a series of courses in February for librarians who wish to increase their knowledge of new developments in library and information science. Plans for the future include a course called "The Politics of Librarianship." For information: Mr. Hall Greaves, Rm. 219 North Hall, Pratt Institute, Brooklyn, N.Y. 11205.

Abstract Bulletins

Multi-Science Publishing Company Ltd. (Assay House, 28 Greville St., London EC1N 8SU) publishes several abstract publications on various technical subjects. Examples are *Electronics and Communications Abstracts, Medical Electronics and Communications Abstracts, Acoustics Abstracts,* and *Noise and Vibration Bulletin.* Free specimen copies available on request.

Information Science Journal

Information Sciences, a journal which began publication in 1968, covers such areas as: statistical prediction and filtering, information theory, communication theory, pattern recognition, identification of systems, adaptive control, stochastic process, and coding theories. Subscription is $30.00 per volume of 4 issues. For information: American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., N.Y. 10017.

NYPL Book Catalog

The New York Public Library is publishing the *Dictionary Catalog of the Research Libraries* beginning Jan 1972. The annual subscription price is $500, but a 20% discount is allowed on the first year's subscription. For information: NYPL, The Research Libraries Administrative Office, Rm. 214, Fifth Ave. & 42nd St., N.Y. 10018.

Information Analysis Services

The Marketing of Information Analysis Center Products and Services (June 1971, 28p., $2.00) is a cooperative publication of ERIC/CLIS and the ASIS Special Interest Group on Information Analysis Centers. Major areas include information analysis center philosophy, services, channels of distribution, advertising and sales promotion, price of services. A case study is also included. The publication is available from ASIS, 1140 Connecticut Ave. N.W., Suite 804, Washington, D.C. 20036.

All Periodicals in CODEN System

The CODEN system of the American Society for Testing and Materials is being extended to include all periodicals regardless of the subject matter to incorporate all of the humanities. New CODEN assignments may be requested by sending copies of title pages to: The CODEN Project, Science Information Services, The Franklin Institute Research Laboratories, 20th and Race Streets, Philadelphia, Pa. 19103. Each request is charged $1.00.

Subscription Agency Change

Ebsco Industries, Inc. has acquired Franklin Square-Mayfair from Ziff-Davis Publishing Company. J. T. Stephens, President of Ebsco, is now serving as General Manager of Frankin Square.

COMING EVENTS

Apr 5–6. Access to Knowledge and Information in the Social Sciences and Humanities: Problems and Implications . . . at the Ford Foundation, New York City. Registration $35.00. For information: Dr. Morris A. Gelfand, chairman, Library Science Dept., Queens College, CUNY, Flushing, N.Y. 11367.

Apr 10–12. Information Industry Association, national meeting . . . at the Roosevelt Hotel, New York City. Contact: Paul G. Zurkowski, Executive Director, Information Industry Association, 1025 15th St. N.W., Washington, D.C. 20005.

Apr 11–13. Institute of Information Scientists, 5th conference . . . at Owens Park, University of Manchester, England. "Management and Information." Conference Secretary: D. F. Styles, 55 Penrhyn Ave., Middleton, Manchester M24 1FP, England.

Apr 14–15. Council of Planning Librarians, 13th annual conference . . . at the Shera-

ton Cadillac Hotel, Detroit, Mich. Contact: Peter Anthony, architecture and fine arts librarian, University of Manitoba, Winnipeg, Canada R3T 2N2.

Apr 20–22. Council on Botanical and Horticultural Libraries, 4th annual conference . . . in Washington, D.C. Host: Smithsonian Institution. For information: Mrs. Ruth Schallert, Botany Branch Librarian, Smithsonian Institution, Washington, D.C. 20560.

Apr 21. Institute on PPBS (Planning-Programming-Budgeting System) . . . at Eastern Michigan University. Registration limited to 75, closes Apr 7. For information: Sul H. Lee, Associate Director of the Library, Eastern Michigan University, Ypsilanti, Mich. 48197.

Apr 24–26. Seminar on Indexing . . . at the University of Maryland Center of Adult Education. For information: National Federation of Science Abstracting and Indexing Services, 2102 Arch St., Philadelphia, Pa. 19103.

Apr 30–May 3. Library Applications of Data Processing, 9th annual clinic . . . at the Illinois Union Building, University of Illinois, Urbana-Champaign. For information: Leonard E. Sigler, Clinic Supervisor, 116 Illini Hall, Champaign, Ill. 61820.

May 4. National Information Retrieval Colloquium, 9th annual . . . at Penn Center Holiday Inn, Philadelphia. Registration $25.00. For information: Susan Nickleach, Research for Better Schools, 1700 Market St., Philadelphia, Pa. 19103.

May 4–5. Library Orientation for Academic Libraries, 2nd Annual Conference . . . at Eastern Michigan University, Ypsilanti. Registration limited to 75 persons. For information: Sul H. Lee, Associate Director of the Library, Eastern Michigan University, Ypsilanti, Mich. 48197.

May 4–6. Council on Library Technology, 6th annual conference . . . at the Hotel Radisson, Denver, Colorado. Theme: "The LTA and Employment—How to Fulfill the Promise." Local Chairman: Harris H. Robnett, Jr., Community College of Denver, 100 East 62nd Ave., Denver, Colo. 80216.

May 4–6. New England School Library Association, spring conference and exhibition . . . in Portsmouth, N.H. For information: NESLA Spring Conference, Memorial Jr. High School, Laconia, N.H. 03246.

May 7–13. Institute on Environmental Science Librarianship . . . at Western Michigan University, Kalamazoo, Mich.

May 9–12. National Microfilm Association, Convention . . . at the Coliseum, New York City.

May 10–13. Society for Technical Communication, 19th Annual International Conference . . . at the Statler Hilton Hotel, Boston, Mass. *Theme:* "A Time for Reassessment."

May 12. Continuing Education: Strategies for Change, workshop . . . at Syracuse Sheraton Motor Inn, Liverpool, N.Y. For information: Syracuse University, School of Library Science, Alumni Association, 113 Euclid Ave., Syracuse, N.Y. 13210.

May 16–18. Spring Joint Computer Conference, SJCC . . . in Atlantic City, N.J. Sponsor: AFIPS, 210 Summit Ave., Montvale, N.J. 67465.

May 22–23. Institute on Teaching Special Librarianship . . . at School of Library Science, University of Michigan, Ann Arbor. Cosponsored by SLA Education Committee (Chairman: H. Robert Malinowsky, University of Kansas Libraries, Lawrence, Kansas 66044).

Jun 4–8. SLA, 63rd Annual Conference . . . at the Statler Hilton, Boston. Conference Chairman: Loyd R. Rathbun, MIT Lincoln Laboratory Library, Lexington, Mass. 02173.

Jun 10–16. Canadian Library Association . . . in Regina.

Jun 11–15. Medical Library Association, 71st Annual Meeting . . . at the Del Coronado, San Diego.

Jun 19–23. American Theological Library Association, 26th annual conference . . . at Waterloo Lutheran University, Waterloo, Ontario, Canada. Host librarian: Erich R. W. Schultz, Waterloo Lutheran University.

REVIEWS

The National Atlas of the United States of America. Arch C. Gerlach, ed. Washington, D.C., U.S. Department of the Interior, Geological Survey, 1970. xiii, 417p. $100.

At last the United States has a national atlas. A dream that was conceived almost 100 years ago has been brought to fruition with the assistance of an appropriation from Congress and the determined efforts, over a period of eight years, of some 84 agencies and bureaus of the three branches of the Federal Government together with many non-governmental organizations, commercial firms, and individuals. Major credit for the successful planning and organization of this highly complex undertaking is given to the editor, Dr. Arch C. Gerlach, Chief Geographer of the Geological Survey, the agency responsible for its publication. He was ably assisted by the competent staff of the Survey and by many distinguished American geographers and cartographers.

The fact that the wealthiest and most powerful country in the world did not have a national atlas while some 40 nations had issued atlases of this type, of varying degrees of excellence, will no longer be a subject requiring explanation, but as a result of its publication, myriads of questions will now be raised about innumerable aspects of its composition. In anticipation of some of these queries, an interesting introduction over the signature of William T. Pecora, Director of the Geological Survey, explains the purpose of the atlas, its evolution; provides technical information about its two basic divisions, about the physical characteristics of the volume, and concludes with acknowledgments and a consideration of its future. In its textured blue binding with the U.S. seal and silver lettering, the first edition of *The National Atlas* is a handsome, elegant publication, and it is complete. Many of the national atlases prepared in other countries have not yet been finished, although the looseleaf binder or map box may rest imposingly on many library shelves. On the other hand, a few have been revised in succeeding editions.

Because national atlases are such complex affairs, few people are sufficiently knowledgeable to comment with authority on more than a small percentage of the many facets of information of which they are composed. This is particularly valid in making comparisons. The time required would be worthy of a thesis. Having had the privilege for many years of taking care of these outstanding publications, this writer nevertheless finds great difficulty in grading them as to excellence. In terms of volume of information, *The National Atlas* ranks in the uppermost percentile, and this is probably the most important feature of a national atlas. How much relevant information does it contain?

This atlas is divided into two broad sections, followed by a place-name index. The first and shorter part consists of general reference maps. With the exception of a double page general reference map at 1:7,500,000 and several perspective views, this section is devoted to a new 46 page sectional map of the U.S. at a scale of 1:2,000,000, urban area maps at 1:500,000, and maps of outlying areas at 1:1,000,000 to 1:250,000. These are clear, well-printed maps showing seven different size categories of inhabited places, various types of airfields, roads, railroads, and ferries, and administrative subdivisions down to county boundaries at the 1:2,000,000 scale, and down to corporate boundaries at 1:500,000. Also shown are national parks, forests, monuments, wildlife refuges, Indian reservations, and other Federal lands. Some 13 different varieties of water features are represented. And while the maps bear no symbols such as hachures, contours, hypsometric tints, plastic shading, or other techniques for depicting terrain, there are a number of spot heights, mountain passes, and the continental divide. One might guess that for reasons of economy, and to provide greater clarity for the other symbols and place-names, topography was not shown on the 1:2,000,000 sheets. The major physical features of this country are revealed on the general reference map at 1:7,500,000 and on the physical maps in the second section, but very few physical features are named. It is unfortunate that the sectional map does not show terrain. Such a map would lend greater assistance in visualizing relationships between environmental phenomena and human activities. The technique of transparent plastic shading developed by the Geological Survey would have been very attractive and useful in this instance.

A map of the U.S. at the scale of 1:2,000,000 is a small scale map, and the user should not expect it to be a detailed source for place-names. In spite of the 41,000 place-names which are shown, it is not detailed at all. As an example, let us consider the North Fork of Long Island, N.Y. The following well-known inhabited places are not shown: Orient Point, Orient, East Marion, Peconic, Cutchogue, New Suffolk, Laurel, Jamesport, and Aquebogue. Only three inhabited places are named: Greenport, Southold, and Mattituck. Such geographic features as Shelter Island, Peconic Bay, and Orient Point are not named. On the other hand, the map indicates that the wildlife refuge opposite my home on Little Peconic Bay is called Morton National Wildlife Refuge. The bay together with the peninsula on which it is located (Jessup Neck) are not named. The sectional map is a compromise. To include a reference map on which most inhabited places and important physical features could be named, say at a scale of 1:250,000, would require 64 times as many pages, which would be seven times larger than this present volume. On the other hand, to have shown a general reference map at only 1:7,500,000 would have almost eliminated the need for a place-name index. Because the United States is such a

large country, it is not possible to portray it in great detail in an atlas, whereas a small state such as Israel is able to present its country in the *Atlas of Israel* on a topographic map at 1:250,000 using only eight pages. Perhaps this comparison will serve to indicate one facet of the enormous task of preparing this atlas. In compiling the special subject maps, the size of the country does not present as great a handicap.

The special subject maps occupy the second broad division of *The National Atlas* and take up 281 pages. They are prepared at three different scales, 1:7,500,000, a two page spread; 1:17,000,000, requiring ½ page, and 1:34,000,000, using only ⅛ page. The subjects are divided into the following major groupings: physical, history, economic, socio-cultural, administrative, mapping and charting, and world. The small scales at which some of this information must be represented may not provide adequate detail for every reader, and in recognition of this fact, the editor has listed additional source material for those who may wish to pursue the subject in greater depth. The scope and magnitude of the information to be found in this section is enormous, but it is not always an easy matter to locate a subject or to determine if certain subjects are covered in the atlas. In addition to a table of contents in which each map title is listed under its major subject grouping, there is an index to map subjects which follows directly after the table of contents. Unfortunately for the user, this too is a table of contents, only in alphabetical order instead of page number order. The alphabetization is by major subject groupings. Under each major subject, each sub-group is in turn listed in alphabetical order. There is no index of individual map subjects in simple alphabetical order. Thus, if one is interested in finding a map of time zones, he must look under the major heading of "Administration," then under the sub-group, "Federal Administrative Areas," and finally, under a sub-subgroup, "Transportation," before he can find it. To find telecasting, which map also shows time zones, as does the map on railroads, one must look under the major grouping of "Transportation." Some subjects covered by the atlas are not indexed at all, such as drainage basins. With a little resourcefulness, the subject can be found under the major grouping, "Water," on the map entitled in the index, "Use," whose actual title is, "Water Use."

In spite of the vast quantity of information which is to be found in this atlas, many interesting subjects are not included. Under "Water," there is no map of water pollution. Under "Transportation," river navigability, river commerce or transportation, are not to be found. I was unable to locate any symbols of current vulcanism or of thermal springs on any of the maps, but in the table of data the names of the major volcanoes are listed together with an indication of their present status. Except where certain flora or fauna are of commercial value, there is no general coverage of these subjects. If one concentrates, he can think of many subjects which the atlas does not cover. Undoubtedly, the editor was aware of this problem and had to decide by whom the atlas would be most used, and which subjects would be of greatest interest to those readers. It was also necessary to determine which subjects were most pertinent to the United States. In certain subjects, it can be argued that there is too much detail. Under "Administration" it appears that the area organization of almost every major Federal agency has been delineated. In spite of these questions of judgment, this section of special subject maps portrays the most important features of this country and cannot fail to fascinate and stimulate the reader.

A map is both a work of art and a working tool. Only by careful research can one determine if it is an accurate map, while anyone can make judgments as to its artistic merit. Like the individual artist, each map publisher has a certain style by which its product can usually be recognized. As this atlas combines the works of many publishers, it contains many different styles. Whether or not they are all considered attractive is a matter of taste. Some, such as the relief maps of Richard Edes Harrison are done in harmonious pastels, while others, particularly some of the maps of the Bureau of the Census, utilize strong conflicting colors. In the latter case the colors may have been selected not so much to please the eye as to insure that one symbol was clearly distinguishable from another. The maps on each page are enclosed in a pleasing, light-gray border. One feature which may be noted by many viewers is the rather strong blue-green color used to represent water on the 1:7,500,000 and 1:2,000,000 scale maps. Why this color was selected instead of a more conventional blue might make interesting reading.

One section in which the publisher had difficulty was in the reproduction of certain map samples of different agencies of the Federal Government. There seem to be two problems, one of which is registry. The second may be due to the use of screens in the color separation process. It appears as though a finer screen might have been less noticeable. There also seems to have been a problem in matching colors. This is not at all characteristic of the atlas. For the most part the maps are drawn in sharp, clear lines and letters. Another blemish appears on p. 158–159 of one of the two copies of the atlas that I have seen. There is a pattern across the bottom of the pages as though a piece of cheesecloth had been left on the green plate.

Six plastic overlays at the three different scales of the special subject maps come with the atlas in a separate envelope. There are two overlays for each scale, one of which contains boundaries of states or counties, and the other which bears names of physical features and drainage patterns. Another useful feature is the "Tables of Data" on p.336 just before the beginning of the place-name index. Here are listed

the longest rivers, largest lakes, highest waterfalls, highest peaks, large volcanoes, large islands, and various physical statistics about each of the 50 states and the District of Columbia.

As noted earlier, an index of 41,000 place-names is not a very detailed list of names for the U.S. At the same time it must be realized that one cannot expect this atlas to be a detailed gazetteer for the same reasons that one cannot expect it to include a detailed topographic map. The United States is just too large to be depicted in such detail in a national atlas. This is an opportune point at which to note that there does not exist a detailed, published gazetteer of this country. Probably the best available published source of place-names for the United States is the *Commercial Atlas and Marketing Guide* published annually by Rand McNally & Co. Unfortunately, this atlas separates the names by states, and the names in each state are divided into two categories, inhabited places and physical features. The United States Board on Geographical Names in Washington, D.C. has published gazetteers for more than 120 countries of the world. It has also issued many decisions lists for names in the U.S., but apparently it has never been able to obtain the necessary funds to put out a comprehensive gazetteer of this country.

The physical characteristics of this atlas as described in the introduction are quite interesting. Undoubtedly most publishers of large atlases, and most government survey departments, undertake extensive research into the quality and characteristics of the paper on which they print their maps. Although one may find the details to be highly technical, he cannot help but be impressed by the tremendous care and research that went into the selection of the paper used in *The National Atlas*.

The same detailed, painstaking research went into the decision of the type of binding to be selected. The advantages and disadvantages of the solid binding versus the looseleaf binding are discussed in some detail in the introduction. It notes that a survey was made, but the occupations of the sample group are not stated. Of those responding, 84% preferred a solid binding. Perhaps the most interesting revelation was the recognition that the binding should be sufficiently flexible to permit the atlas to open flat, and that "there should not be a conspicuous channel or separation along the spinal fold." It notes that in the case of this atlas many of the maps extend across the fold, and that therefore the foregoing provision was most important. There then follows an impressive account of why an adhesive binding was preferred to a sewn binding, and the extensive bids, specifications, and testing that went into the final selection of the modified "perfect binding" that was finally selected. It is most unfortunate that as superior as this binding may be in most respects, it fails completely to eliminate the conspicuous channels that interrupt, distort, and conceal parts of the many maps which extend across the fold.

Despite the compactness, ease of shelving, and greater security of the individual maps which the solid bindings afford, I should have preferred a ring binder, pin binder, or a box. I do not agree that the solid binding is more impressive than looseleaf bindings. One has only to look at the atlases of Germany, The Netherlands, Peru, Sweden, or Switzerland to see how impressive a looseleaf binder can be. The solid binder is neater, more compact, less expensive, and has a more finished appearance, but it lacks the impressive size of the large looseleaf national atlas. The solid binder has more impressive arguments than appearance upon which its selection might be based. It is easier to handle, easier to file, and easier to find a map in it, but against these advantages is the fact that you cannot remove the map. A removable map can be laminated, more easily exhibited, more easily reproduced, and more easily used to compile other maps. It is also easier to make measurements on a map that will lie absolutely flat. Of course, it can be misfiled, lost, or stolen more easily, but maps in solid bindings disappear too. A looseleaf map can be replaced and it can be revised without having to replace the entire atlas.

In looking ahead it is obvious that to obtain a revision of any sheet in this atlas, one will have to purchase a revised edition of the entire volume. At the present $100 per copy this is not a step that falls within every budget. Some of the data were out-of-date before the atlas was published, and it is unfortunate that these maps cannot be replaced sheet by sheet as the new data from the 1970 census become available in map form.

Despite the number of shortcomings which have been noted in *The National Atlas of the United States of America*, and undoubtedly there are others which will be pointed out by other reviewers, one must conclude that it is a monumental work of high quality. Never before has more information about the United States been compressed into such a small cubic space. Now it is available to the seeker of special reference information, or to the reader who can literally browse for days and weeks trying to absorb and comprehend the wealth of fascinating information which it contains.

Nathaniel Abelson
Dag Hammarskjold Library
United Nations
New York

ERIC/CLIS ABSTRACTS

The abstracts that follow are based on those prepared by the Clearinghouse for Library and Information Science of the Educational Resources Information Center (ERIC/CLIS). These abstracts were selected from the Clearinghouse's January 1972 listing.

Unless otherwise specified, documents may be ordered in either microfiche (MF) or hard copy (HC) from: ERIC Documentation Reproduction Service, LEASCO Information Products, Inc., Post Office Drawer O, Bethesda, Maryland 20014.

Orders must include ED number and specification of format desired. There is no handling charge, but payment must accompany orders totaling less than $10.00. Book rate or library rate postage is included in the prices. Order blanks containing further information may be obtained from LEASCO Information Products.

Information Requirements of Researchers in the Social Sciences. Volume 1: Text. May, 1971. 280p. ED 054 806. MF $0.65; HC $9.87.

Institution (Source): Bath Univ. of Technology (England). Library.

The main findings of an investigation into the information requirements of the Social Sciences, conducted between Sep 1967 and Dec 1970, are reported. It covers the information needs of social science researchers, and of teachers in social science departments of universities. The objective of the investigation was to provide material useful for the design of information systems. Data were collected not only on current information gathering practices and information uses but also on more fundamental issues relating to the nature of the work being carried out and the type of information required for it. Three methods of investigation were used: 1) a questionnaire circulated to a national sample drawn from a population of all the social science researchers that could be identified, 2) interviews and 3) day-to-day observation of a very small number of social scientists. A review of relevant literature and work already conducted was an essential ingredient of this investigation. (Volume II of this report which contains the tables of the study is available as LI 003083; ED 054 807) (Author/NH)

The Administrator of a Special Library or Information Center and His Situation. Final Report. Bundy, Mary Lee, et al. Sep 1970. 126p. ED 054 799. MF $0.65; HC $6.58.

Institution (Source): Maryland Univ., College Park. School of Library and Information Services.

Sponsoring Agency: Office of Education (DHEW), Washington, D.C. Bureau of Research.

In the study of the special library and information center administrator, 150 special libraries and information centers reporting staffs of ten persons or more were selected. Ninety-five respondents completed and returned the questionnaires. Full details of sample choice and design and an analysis of the returns are contained in the Appendices. It was concluded that instead of the concentration on physical plant and collection development so evident in other library situations, change phenomena in the special library involved the new technology including client-oriented computer applications, advances in the use of micro-reproduction, and participation in sophisticated network designs. There was a greater propensity to focus upon client requirements and satisfactions as the basic measure of the library contribution. And yet, this administrative class presents no model of active, impatient leadership committed to a reconstitution of library and information services. The evidence in this study revealed no urgency to shift from prevailing practice, to reassess and to reshape the basic philosophy of the field in order to influence change in the nature of the services, in clientele priorities, or in service orientation. (Other parts of this study are available as LI 003071 through LI 003073) (Author/NH)

Education, Careers and Professionalization in Librarianship and Information Science. Final Report. White, Rodney F. and Macklin, David B. Oct 1970. 173p. ED 054 800. MF $0.65; HC $6.58.

Institution (Source): Trent Univ., Peterborough (Ontario). Dept of Sociology. Keuka College, Keuka Park, New York. Dept. of Behavioral Sciences.

Sponsoring Agency: National Science Foundation, Washington, D.C. Office of Education (DHEW), Washington, D.C. Bureau of Research. National Library of Medicine (DHEW), Bethesda, Md.

The objective of this study was to analyse the processes by which individuals enter the occupation of librarianship and are prepared for positions in the field. Attention was directed to the ways in which the educational institutions who prepare these entrants are responding to the challenges which are being presented them by the increasing demands for information in the society and the technological advances in the handling of it. The methods employed in

the study included both a mail survey of students and faculty in all the ALA accredited library schools in the U.S. and Canada, and visits to a majority of the schools by the investigators. During the visits, interviews and discussions were conducted with both students and faculty members. Both students and faculty expressed the need for changes in current library school programs, but the major ones they desire are of a technological and applied character rather than in the intellectual aspects of the curriculum. Thus, although the needs for reform are recognized, the likelihood of any early changes in either curriculum or organization is not anticipated, and the programs are likely to face increasing competition from those in other parts of the university. (Author/NH)

ISIS (Integrated Scientific Information System); A General Description of an Approach to Computerised Bibliographical Control. 1971. 120p. ED 054 801. (Avail. International Labor Office, Washington Branch, 666 Eleventh St., Washington, D.C. 20001; $1.50.

Institution (Source): International Labour Office, Geneva (Switzerland).

An ensemble of information systems being developed by the Central Library and Documentation Branch of the International Labour Office, a specialized agency of the U.N. located in Geneva is described. ISIS (Integrated Scientific Information System) was designed and is now being used to assist in the provision of library and documentation services, as well as to support the management of the library's internal operations. ISIS is comprised of three major interdependent systems: a system for control of bibliographic information, a system for serials control, and a loan system. The system's interdependence lies in the fact that some modules, some programs, and some manual procedures are used by several systems. The Bibliographic Control System is at this time the most complex and fully developed of the three. The documentation on ISIS is divided in four parts. Part One describes the Bibliographic Control System, Part Two the Loan System, Part Three the Serials System, and Part Four is a preliminary attempt to sketch out a pattern for control and evaluation of the system. Technical details regarding the computer facility, the programs and the files used are in the Appendices. (Author/NH)

Leadership Development for Librarians. Penland, Patrick R. 1971. 110p. ED 054 840. MF $0.65; HC $6.58. Avail. Bookstore, University of Pittsburgh, Pittsburgh, Pa. 15213 ($2.00).

Institution (Source): Pittsburgh Univ., Pa. Graduate School of Library and Information Sciences.

The purpose of this manual is to provide a guide to the in-service training of librarians for community liaison through the group work process. The manual was developed for the supervisor participants in the Institute on Discovery Management for Supervisors of Library Branches Serving the Underprivileged and Emerging Communities and is a companion volume to the institute papers, "Communications Management of Human Resources" (Bookstore, University of Pittsburgh, 1971). The aim is to provide a training manual which will lead to competence in group discussion methods and to an understanding of the major problems associated with group activity and community development work. The sessions have been designed to help a group acquire increased sensitivity to the major factors involved in the discussion process; understand the importance and value of group discussion methods; develop skill in diagnosing the problems which a group leader may handle; acquire experience in leading discussion, in order to build leadership skills; and understand the role of skillful interpersonal relations as a technique for bridging the gap between the "passivity" of discussion and the activism of community involvement. This manual includes a number of separate topics which could be covered in a short training program. (Author)

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