

## Obsolescence

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D. KAYE GAPEN  
SIGRID P. MILNER

OBSOLESCENCE HAS BEEN DEFINED by Line and Sandison as the “decline over time in validity or utility of information.”<sup>1</sup> This concept is of obvious interest to information theoreticians who concern themselves with the development, career and eventual death or incorporation of particular kinds of information. But it is also of interest to practical librarians who administer growing collections in finite spaces. Such librarians look to research on obsolescence to help them decide which items to keep and which to store or discard in order to make room for new acquisitions. Ideally for remote storage or discarding, research on obsolescence would culminate in simple mathematical formulas which could be applied with equal success to any and all libraries. Obsolescence research has produced many mathematical formulas, but unfortunately they have been neither simple nor universally applicable. The best researchers are the ones who have admitted that obsolescence is a far more complicated and more hypothetical concept than we have hoped. Only that research which has been transmogrified into biblio-folklore—“journals can be discarded after seven years,” “everyone knows chemistry books become obsolete more slowly than physics books”—is simple, and it is generally incorrect as well, either in expression or application.

The concept of obsolescence has itself suffered a decline in fashion such as may be responsible for apparent obsolescence of information in

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D. Kaye Gapen is Dean, University Library, University of Alabama, Tuscaloosa, and Sigrid P. Milner is Personnel Intern, Iowa State University Library, Ames.

certain fields. Gosnell's classic paper published in 1944 referred to several earlier studies.<sup>2</sup> But in the two succeeding decades, relatively less was written, perhaps, as Evans has suggested, because vigorous library building made the subject less compelling.<sup>3</sup> In the 1970s, however, and certainly in the 1980s, tightening budgets have resulted in a resurgence of interest in obsolescence, including the reprinting of Gosnell's article in 1978. Increased periodical costs have made it imperative to cancel some subscriptions, and librarians have turned once again to obsolescence research in hopes that the concept can be employed to forecast future use as well as to describe current or past use.

### Review Articles

Two major state-of-the-art reviews summarize the research that had been done on obsolescence prior to their publication. A two-part article by Seymour was published in 1972.<sup>4</sup> She considered monographs and serials separately since obsolescence is somewhat different in each case. She pointed out that up to that time most of the articles on obsolescence had been written by Americans (just the opposite has been true in recent years), and she saw the research as a response to two problems: the publishing explosion and the concomitant lack of space. She argued that obsolete material on the shelves is not in itself merely a neutral factor, becoming negative only insofar as it prevents display of more useful information, but is a definite negative because it hinders the search for relevant material. Taylor stated along the same lines that obsolete material may cause a loss of confidence in the library by its users, particularly undergraduates, since only the useless material is left on the shelf while the relevant material circulates.<sup>5</sup> Unfortunately, this statement assumes an absoluteness of value, that a set of books has the same ranked usefulness to all researchers, when in fact different researchers, and even the same researcher at different times during a project, will rank the usefulness of particular books differently. In addition, the alternative to having mostly less useful volumes on the shelves would seem to be having mostly empty shelves, assuming the number of volumes in circulation at any one time remains constant. Most researchers, including undergraduates, would probably find some book preferable to no book.

Trueswell's calculations have shown that 99 percent of a library's circulation needs can be satisfied by less than half of most collections.<sup>6</sup> But Seymour points out Trueswell's underlying assumption that the circulation requirements of users are prime concerns of the library. All libraries may not wish to accept this basic assumption. And his statisti-

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cal results still leave working librarians with the problem of determining which individual volumes are not being used, a problem not necessarily made easier by increasing automation of the circulation system. But initially, the decisions of which volumes to store or discard were made qualitatively by experts, either faculty members or specialist librarians. Given the effect of storage upon use, the selections became a self-fulfilling prophecy. Stored on the assumption that they would be less used, they *were* less used—perhaps because of their uselessness, perhaps because of the deterrent effect of their storage.

Some recent literature has attempted to reproduce the judgments of experts through mechanical or formulaic means without paying too much attention to the actual validity of the judgments. Fussler and Simon, for example, found that by analyzing functions of past use, publication date, and language, they could achieve almost unanimous agreement with the faculty experts in chemistry and economics.<sup>7</sup> Past use was an especially significant predictor of future use. But in English literature and Germanic literature, there was great disagreement between the experts' opinion and any of the functions. It is a little hard to see why this is true, if in fact scientists use chiefly more recent material which would have no past use, while scholars in the humanities use chiefly older material with a much longer history of use; yet none of the three factors was an accurate predictor of use. Seymour concluded that although weeding by means of past circulation was most efficient, it was also disproportionately most costly because of gathering the data and changing the individual records. Weeding by publication date or age was least efficient because some heavily used books were stored; yet because of the ease of implementation, this method may be the most cost-effective. A two-tiered system might become possible with such a weeding program, and indeed might be informally put into effect by alert pagers: the most frequently recalled stored volumes might be left in a particular area or on a shelf more easily accessible than the general storage area. It is unfortunate that academic libraries are not more committed to continuous derivation of use data about their collections. A great deal of such data could be easily gathered through the automated circulation systems many universities now have, and would provide practical grist for the theoretical mill. Unfortunately, too many automated systems were brought up without much concern for their research possibilities.

In the second part of her article, Seymour pointed out that serials, being a different format from monographs, also had a different use—especially greater in-house use. One of the biggest problems in the body of literature about obsolescence is how to deal with in-house use. Some

studies have shown that in-house use is similar to, but greater than, circulation. This finding will be discussed later, but even if we accept it at face value here, it does not solve the problem for the many libraries with noncirculating periodicals. The research has relied chiefly on citation data to identify individual volumes or entire runs of journals for relegation to storage. As Sandison has pointed out, citation data do not refer to any particular library; therefore, they do not shed light on local use patterns or local user populations. Studies by publication date, language, number of libraries holding the serial, position on ranked lists, and other functions demonstrate that past use is again the best predictor of future use. Fussler and Simon have detected a "family quality" in volumes of a serial.<sup>8</sup> This means that the use patterns of the entire serial set are alike, and the whole run should be stored or retained. It is not clear how the effect, if any, of various kinds of special issues—the annual bibliographic issue, for example, or a single-theme issue—was allowed for, or what effect reprinting and photocopying have on journal use. Researchers have devised a "half-life" value for scientific journal articles. As Seymour pointed out, it might better be termed the median citation age, since it represents the point at which half of all the citations to an article which are going to be made have been made. The use of this figure is not immediately apparent, since one would not wish to discard or store a volume which had half its useful life still ahead. No judgment can be made as to whether the first half or the second half of the citations is more valuable; only that the first half is likely to come more quickly. Some researchers believe that all journals older than a certain date should be stored, while others find storage of entire runs better, particularly if subscriptions have been canceled.

A second review article, by Line and Sandison, strikes at the heart of some easily made assumptions about obsolescence.<sup>9</sup> They discuss a number of reasons for changes in the use of literature over time. The information which the literature contains may be invalid, or may be valid but incorporated in or superseded by later work. Most interesting of all is the case where information is valid but in a field of declining interest or fashionableness. In each of these cases, the literature will experience a decline in use. Much of the literature will still be of interest to the historian of the field, even if it contains invalid information, but use of the information *qua* information will decrease. In some cases, use of literature can increase. For example, if the information was formerly considered invalid but is later recognized as valid, if a lag in technology or theory delays exploitation of valid information (as was the case with movable type, for instance), or if the information is valid and in a field of increasing interest or fashionableness, then in each of these cases the

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literature will experience an increase of use. Too many researchers have ignored the interplay of these complex factors and settled for a simple model of linear or exponential obsolescence.

A further theoretical problem which Line and Sandison brought out is that although information and knowledge are recorded and communicated in documents, the relationship between document use and information validity is by no means a direct one. A document which is difficult to obtain may be less used although the information is potentially useful. They stated definitely that what has been considered the "law" of obsolescence—decline of use over time—is in fact nothing more than a hypothesis still to be tested.<sup>10</sup> Apparent obsolescence may be due to a number of irrelevant factors. Literature can be used in two different ways: for current awareness and for a basic search on some particular topic. Obviously new literature, and perhaps especially new journals of a particular type, will be used for both these purposes. Older literature and "archival" journals will be used chiefly in the second way. This differentiation in type of use might account for part of the "obsolescence curve." The growth of literature also could affect the results. One way in which literature has grown is in the tremendous increase in number of publications. So many more monographs and journals are being published now that even if the percentage that was being used were no greater, the absolute number would be many times greater. Other possible factors are the increase in number of journal articles per issue, length of article or monograph, number of footnote citations or references per article or monograph. It appears that no researcher has attempted to come up with a statistical corrective to any bias which these factors might introduce. One study suggested that it would be possible to subtract literature growth (discovered by counting articles) from apparent increase in use of more recent literature, thus deriving actual increase, but did not actually do such a computation.<sup>11</sup> In any case, merely counting articles would probably not result in a sophisticated adjustment factor.

The relationship between citations or references and use is another uncertainty. Thesis advisers have long been aware of the purely "ceremonial" reference, made to a venerable but unused source. Similarly, some sources are actually used in the production of research articles but are not cited because of editorial restrictions or unwillingness to indicate indebtedness to such a source. Some uses of current-awareness tools may lead only indirectly or not at all to research results; yet who is to say that published research is the only "use" to which information can be validly put? Journals dealing with the teaching of a particular university subject might only rarely be cited in "core" journals, but they might

be read and acted upon by many. This, of course, gets at the fundamental question, "What do we mean by use?"

A final basic point raised by Sandison and Line is the often ignored distinction between synchronous and diachronous use studies. Most studies are synchronous, since diachronous ones are time-consuming and difficult to do; but researchers have shown that synchronous and diachronous results need not be the same, and that in certain cases they are markedly different. Synchronous studies are those which compare use at a particular time to the age of the items. They might, for instance, plot the publication dates of all items charged out from a library during a particular period, even a lengthy period as was done in the University of Pittsburgh study. Or they might analyze the publication dates of cited sources for serial articles in a given year or years. Basically, such studies look backward from a point in present time. But what we are interested in for weeding is the use that individual titles will receive in the future. Here a diachronous study is necessary, one which follows particular books or articles through their useful life span. Ideally, a study like this would trace an entire collection through its total uses, or rigorous sampling methods could authenticate less comprehensive studies. In practice, diachronous studies tend to be like the Fussler and Simon study which compared the use of particular books in two five-year time periods. A diachronous study looks forward from publication date to the use a book will receive, and is therefore more reflective of the future use of similar books. Diasynchronous studies would also be possible which would compare two statistically related synchronous studies, but such research has been rare. Line and Sandison warned that studies based on the various citation sources must take into account fluctuations in coverage of the source, such as occurred with the first years of *Science Citation Index*.

### Other Articles

The research since these review articles has been based on three chief sources of data: citation studies, use studies based on circulation, and use studies based on reshelving statistics. Sandison's article on physics journals used the same data as an earlier study by Chen.<sup>12</sup> The raw data presented by Chen for the use of 138 physics journals at Massachusetts Institute of Technology (MIT) showed a rapid decrease in use as the journal aged, but she failed to allow for the relationship of numbers of items used to numbers available for use, in this case, meters of shelf space. This correction for "density" produces quite a different picture revealing no decline in use. Of the ten most frequently used

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journals, eight conventional journals showed a peak use at twelve to sixteen years, while two journals of advance publication peaked at six to seven years. Further use data from the British Lending Library confirmed these findings, according to Sandison.<sup>13</sup>

In 1975, Sandison collaborated on an article with Line to point out information needed before citation and library use studies would be of practical help in libraries.<sup>14</sup> They mentioned such things as the relative size of journals, which they considered important enough to be made a special project of some national library; uses per subscription cost; uses per article; recalls per keyword; and so on. Only when citation and use studies take these factors into account will they be of any use either to librarians making decisions about journal subscriptions, discarding and binding, or to information system designers selecting material to scan and items to include in an information system.

Taylor, too, sought a practical solution, this time to weeding, partly in response to the earlier Seymour article.<sup>15</sup> He discussed the benefits and problems of a weeding program, suggesting (as mentioned earlier) that obsolete material on the shelves can permanently discourage patrons. He compared subjective with objective criteria as the basis for weeding decisions, and finally attempted to formulate a method for identifying those periodical volumes which should be stored. The basis for such a method could be reshelving data, citation data, photocopying data, circulation data, or national loans data. The Newcastle research revealed that a reshelving study nets only 20-25 percent of actual in-house use; and that even with saturation propaganda concerning the study to prevent user reshelving, it was only possible to raise the level to 40 percent. His general formula was the 15/5 rule: a journal is a candidate for storage if none of the last fifteen years of the journal has circulated during the last five years. He excluded recent subscriptions with fewer than five volumes received, and altered the rule somewhat for titles in the humanities and discontinued titles. Nevertheless, this rule should be of help to those libraries which circulate periodicals. It is expressed in a fashion different enough so that it does not oversimplify the complexity of obsolescence, although it offers some aid to weeders.

Bulick and his associates, in what was termed a historical approach, used preliminary data from the University of Pittsburgh study to analyze the use of materials acquired in 1969.<sup>16</sup> They found that first-time use was greatest in the year of acquisition (1969), consistently falling off after that until 1974, the last year for which data were presented. By 1974, 56 percent of the acquisitions had been used at least once. There was a similar drop in number of times circulated, so that the largest percentage of items (about 14 percent) circulated once each, and

the smallest percentage (0.19 percent) circulated twenty-five times. It is difficult to interpret these results, since we do not know the date of publication of items, nor the processing lag time and other environmental factors at the specific locale—in this case, the Hillman Library at Pittsburgh.

In 1977, one of the few studies of nonscientific journal literature was published.<sup>17</sup> Longyear found that journal articles in musicology do not show an obsolescence pattern like scientific literature, and that even articles seventy years or older are cited significantly. Further studies should be done in other areas of the humanities and social sciences, and an attempt made to discover whether there is any obsolescence pattern for these fields at all.

Pan has argued that rank lists of journals based on citations can be used as indications of library use.<sup>18</sup> Line attacked this idea, and showed that only a local-use study is of significant practical use in the decisions which librarians make.<sup>19</sup> Typically, librarians are concerned with canceling subscriptions of the lesser-used journals, ones which are so far down the list of ranked journals that their position is largely a matter of chance because of a difference from other journals of only one or two citations. Line's conclusion is that citation analyses and rank lists "can be of great interest, and some value—but not to the practicing librarian."<sup>20</sup>

Hindle and Buckland have studied another research method—the employing of circulation data to reflect use both in and outside the library.<sup>21</sup> The assumption has been made that circulation data are indicative of total use; but for purposes of weeding, it is necessary to show a title-by-title relationship of circulation and in-house use. Two studies at the University of Chicago and Newcastle-upon-Tyne Polytechnic tended to show such a correlation. But the Newcastle study also showed that the number of volumes used was apparently five times the number left to be reshelved, which may cast doubt on some studies based on reshelving data. A University of Lancaster study seemed to show that books used in the library are also the ones which circulate as a class. In-house use and circulation tend to vary directly, but these data reflect usage, not demand. Usage and demand are identical only at zero and diverge increasingly as demand increases. If a book is out seven or more times a year, the researchers pointed out, the amount of time it spends in the library is reduced enough to make research results erratic, since in-library use is dependent on what is on the shelves. Their conclusion was that in-house use often fell perforce on "unpopular books." Their article suggested that in most cases an easy research technique would be



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to compare circulation data with a random shelf-list sample and a "desk sample" of those books left unshelved.

Gosnell's 1944 article was reprinted in summer 1978, with an editor's note which observed that earlier studies on obsolescence had not been followed up. The editor stated that at the time he knew of no library which continuously derived, reviewed and incorporated obsolescence data;<sup>22</sup> and we know of no such library at this time. Gosnell based his study on the analysis of three book lists recommended for college library acquisitions. He was able to demonstrate that newer and more recent books were preferred by the makers of these lists, and postulated the existence of an average book "mortality" which could be applied to all books in general, as life insurance mortality tables apply to all members of the population. He found that various subjects in the three lists had an obsolescence rate of from 1.5 to 31.3, with the overall averages being 8.1, 8.4 and 9.6. Gosnell then analyzed the holdings of five college libraries and found generally lower obsolescence rates, i.e., a greater percentage of older titles. This was particularly true in the classics, where two libraries had a negative obsolescence rate, signifying a preponderance of older material. An analysis of circulation at Hamilton College showed a much lower obsolescence rate, about 4.9 overall. Gosnell suggested that these obsolescence ratings could be used for accreditation purposes.<sup>23</sup> They might also have significance for departmental book budgets: a field with a lower obsolescence rate might be able to get by with a smaller budget than a more rapidly obsolescing field, or conversely, a book purchase in a field with lower obsolescence might be more cost-effective since it could be used for a longer period.

Bronmo put greater emphasis on the importance of literature expansion.<sup>24</sup> He called for diachronous studies which would prove or disprove the possibility that apparent obsolescence is merely a function of the growth of the literature. He studied the use of books on literary criticism at the University Library of Tromsø and found that for books published after 1945, date of publication was not a significant predictor of use. He admitted, however, that his results would probably not apply to other libraries, although he theorized that more significant works in literary criticism had been published between 1950 and 1954. His studies excluded any books which he believed to be noncirculating because no one lectured on those authors or wrote a thesis about them during the year of his research. His conclusion was that "bibliometric studies very seldom have any immediate results."<sup>25</sup>

### University of Pittsburgh Study

Perhaps the most famous recent study of obsolescence has been the Kent study at the University of Pittsburgh.<sup>26</sup> The purpose of the study was to develop measures for determining the extent to which library materials are used and what the costs are, to improve acquisitions decisions, and to determine storage or discarding points at which alternatives to local ownership of various items became feasible. The research was carried on over a period of seven years from 1968 to 1975 and was based chiefly on circulation statistics, in-house use sampling, and journal use sampling at six science libraries. They found that 39.8 percent of the books acquired in 1969 did not circulate by 1975. Of those that did circulate, 72.76 percent were borrowed during the year of acquisition or the following year. The circulating items represented 75 percent of the titles used in-house, 99.6 percent of the outgoing interlibrary loans, and 98.1 percent of the reserve collection. They determined that 54.2 percent of the 1969 purchases should not have been made if two uses were considered cost-effective; 62.5 percent, if three uses. Unfortunately, most libraries have not yet determined how many uses of a book are cost-effective. The Pittsburgh reshelving study found that 24.86 percent of books used in-house had never circulated and 43 percent did not circulate within the sample time period or within the year following the sample period. The researchers concluded that 75-78 percent of the in-house books did circulate externally and, therefore, that external circulation data provided a sufficiently accurate reflection of use.

Journals at the six science libraries generally had low use, except in the physics library, where the librarian had aggressive "marketing" techniques. Interestingly, photocopying of journals increased 13 percent after the first two years following publication, and increased a further 11 percent after fifteen years. The proposed weeding rule derived from all these data stated that an item should not be weeded before it is seven years old, and only items which have not circulated should be weeded after the age of seven.

### Summary

Much basic research remains to be done on obsolescence. Researchers have taken the concept as proven, but in fact it is still only a hypothesis. The studies that have been done have concentrated heavily on scientific fields at the expense of the social sciences and the humanities, and on journal articles at the expense of monographs. More should be done in the humanities, if only to determine whether obsolescence is

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a concept which cannot be usefully applied outside of the sciences. Published articles need to be more informative about methodology, not just giving results. In many cases, it is impossible to discover if the reserve and reference collections are included in or excluded from the percentages, an apparently small factor which could have a disproportionately large effect on the results. We need to consider what is meant by "use," and whether we can assign different values to different uses by different populations, or whether we believe (or prefer to act as if we believe) that all uses are equal. Should discarding be adjusted for irregularities in the curriculum, as Bronmo did when he excluded literary criticism not circulating because no professor lectured on those authors during that year? If no, the library may respond drastically to temporary valuations. If yes, the library may be failing to respond quickly enough to shifts in research fields. Many studies have been motivated by a need to discard something and have been interested only in what should be discarded, not in an ideally objective research model. This paper has already indicated the problems of differentiating between synchronous and diachronous studies, and the greater usefulness, as well as difficulty, of the latter. It has been assumed that circulation reflects in-house uses as well, but that may be inaccurate. Kent stated that 75 percent of the titles used in-house had circulated during the sample period;<sup>27</sup> this leaves one in four of the in-house uses not reflected in circulation. Hindle and Buckland noted that the number of nonrecorded in-house uses in a study at Newcastle-upon-Tyne Polytechnic Library was twenty times the number of recorded uses.<sup>28</sup> They also found that reshelving nets 20-25 percent of in-house use, which can be raised to 40 percent by saturating the area with propaganda about the reshelving study. Clearly we need an accurate way to determine in-house use before we can conclude that it is reflected in external circulation records. In addition, we need research on the extent to which planned or random factors in the library can affect obsolescence. How much can libraries affect use of material by layout and stack arrangement, by "marketing" techniques, by storage, by cancellation of journal subscriptions, or initial failure to buy? All these areas must be far more thoroughly researched before we can claim to understand obsolescence.

### **Implications**

And what has all of this meant to the librarian in the field? Unfortunately, not much. Not only is the concept of the obsolescence of literature and its implications for weeding and purchasing a touchy, political

issue, but the almost contradictory results of the research done to date have only clouded the issue further.

First, the problems with the research completed thus far include the failure to build upon past research in either disproving or proving older hypotheses; there has not evolved a body of agreed-upon definitions nor a common vocabulary; data gathering in a variety of library situations is not done consistently; the mathematical nature of the theoretical work is generally unclear to most practicing librarians; and because there is no model or methodology which can be applied by librarians as part of the ongoing library operation, obsolescence is not a topic often chosen by librarians for consideration as a research or management activity. Indeed, the evidence available thus far supports almost any course of action because the research results are contradictory and ungeneralizable. As Line and Sandison point out, we have not yet even proven the validity of the concept of obsolescence. Even if one disagrees with Line and Sandison, every other study speaks strongly to the necessity for investigation in each individual library to determine local and ad hoc use peculiarities. And so librarians make decisions every day about what to buy, what to store and what to discard, relying on their own judgment.

Second, the significant question could be asked (and is raised by some of those whose research is reported here) as to whether the effort required in undertaking use studies, or in gathering other obsolescence data, justifies the time and effort required. Not only would it take more time than is now invested in maintaining awareness of collection use, but there is no guarantee that the results could be applied any more consistently nor be more beneficial. Most librarians are not yet convinced that this is a viable or more than peripheral topic.

Third, while the theoretical and mathematical nature of obsolescence can be investigated away from the library environment, the proof or disproof of the theorems lies within the library doors, and it is unfortunately often the case that the researcher and the librarian (if not the same person) are not in sympathy with one another. We are all familiar enough with this phenomenon to know that little credence will be ascribed to research activity when some of the people affected have not "bought into" the methodology and its results. This is particularly true for a topic such as obsolescence, in which mathematical and theoretical skills must be linked to an intimate awareness of local library idiosyncracies, past practice and past selection practices.

A final reason why research results have had only limited application is that this area of library operations (buying, storing, discarding) is one of the most uncertain and risky when we consider the implications

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of incorrect actions. Not only are users denied immediate access to desired information, but it is becoming increasingly difficult to fill in gaps in the collection because of such factors as shorter print runs, etc. Even the studies that are successful mathematically have not been able to arrive at an algorithm or a guideline indicating which "particular" book or volume or issue is the one which will or will not be used. Human nature usually responds to situations involving high risk and uncertainty in as safe a manner as possible. In this instance, it means relying on one's own judgment in assessing the political and practical realities rather than on some researcher's incomprehensible mathematical recommendations.

### **Today's Circumstances**

The circumstances of yesterday, however, are not those of today. More librarians today must deal with the practical difficulties of shrinking budgets and limited space for collection growth. Then, too, there are the more difficult policy issues related to cooperative activities, networking and any concomitant shared collection-development agreements. The expansion of networking possibilities causes us to look anew at such questions as the importance of local autonomies, the possible limitation of the capacity to respond to local user needs promptly and fully, and the possible irreversibility of shared collection development decisions.

In addition, today's decision-making environment is expanding to include the involvement of people outside the library—faculty, students, administrators, legislators, etc. Each of these people brings different and sometimes conflicting needs, demands, pressures, fears, and beliefs which must be responded to or resolved in some manner.

Finally, for many there looms on the horizon the feeling that today's technological explosion might shortly make librarianship as we have known it obsolete. Even if that extreme case does not occur, it certainly seems possible that technologically advanced storage devices, collection access devices, communication lines, publishing and marketing innovations, and so forth will greatly alter what information libraries have to store, which users libraries might serve, and how that service might occur.

### **A Problem-Solving Management Model**

Research in preparation for this article has shown that the questions which remain to be answered in what has until now been consid-

ered a peripheral topic (obsolescence), and the questions which need to be answered in responding to a central topic (operating libraries in today's world), are intertwined and answerable only through the development of a new problem-solving/management model.

### *Incorporating the Model*

The purpose of such a model would be to allow a library to derive, review and incorporate data on obsolescence day by day. While a model such as this can be designed in relation to other research topics such as catalog use or budget forecasting, obsolescence can serve as an example in describing how to go about bringing the librarian and the researcher together. First, what has become increasingly obvious to many librarians is the need for a more sophisticated application of management techniques and decision-making tools which can support library operations practically. These tools need to be based upon and built into daily library operations since the time required for data gathering and analysis can be extensive and will not be taken consistently if the work is "add-on" rather than "ongoing."

Since, however, information transfer and use (the basis for all library service) is still a highly theoretical topic involving human psychology, intelligence, habit, diligence, and laziness (to name but a few human qualities), it is impossible to approach solely as an operations management issue. In addition to administrative techniques, therefore, we also want to include aspects of behavioral psychology, statistics and mathematical analysis.

To construct the basic framework of the model, what is needed is the union of the librarian and the researcher in a joint effort which can utilize the best which both have to offer. The librarian brings the in-the-trenches, day-to-day, practical experience with the library user and the materials used. The researcher brings the mathematical, modeling and analytic skills. Together, the two could build a framework for data gathering and analysis designed to be implanted into the library's ongoing operations. While we would hope that the methodology would permit as much generalization as possible, much more can be gained if the model is sophisticated enough to be applied in a variety of types and sizes of libraries, so that the patterns which might exist at the local or national level can be detected as ad hoc results are combined and analyzed.

### *Constructing the Model*

The forum for constructing this model exists either in the American Library Association, where the various divisions have research and

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policy committees, or in networks organized for other cooperative endeavors. What is proposed here is a broad outline of how the model might look and be applied. The purpose is to gather as complete and consistent data as possible for a spectrum of libraries. In the case of obsolescence there are two main questions which can be proposed. First, what are the use patterns in libraries, and how can that use be ascertained? Second, what are the causal factors which interact to produce those use patterns? In relation to the latter, we have been relying on random influences, assuming they balance one another out, to produce a quantitative ranking. But, as book publishers know, publicity, location, and even color of book jacket can affect use. "Marketing" in libraries is another element which can affect use.

Other causal factors might include questions as to why and how people do research. For example, concepts of the research project seem to change during the course of research through refining and discarding unusable topics. How would this pattern affect the use of materials in libraries? One purpose of the model would be to distinguish true information use patterns from those information use characteristics resulting from local library policies, national policies and publisher marketing policies.

### *Elements of the Model*

The first part of the model, then, would be designed to gather as much descriptive information as possible. The descriptive information can be compared and combined to determine correlations among a variety of possible elements. Elements to be considered might include:

1. *Collection description*: What is the nature of the institutions, student population, curricula, faculty research interests, collection policies, duplication agreements, weeding policies, and management of the collection policies?
2. *Acquisitions policies*: How is the material budget divided between serials, monographs and other formats? Who is responsible for selection? Are there any resource sharing agreements which might prescribe acquisition policies? How are funds allocated?
3. *Technical services practices*: How quickly after publication are materials ordered? How quickly are materials received? How quickly are materials processed, cataloged and otherwise made available? What backlogs exist, and what is their nature, size and age? What public catalog or other access tools are available? How many catalogs are there and what is their nature? How are copies, volumes and locations indicated? What filing rules are used?

4. *Circulation practices and policies*: Are users notified in some way of new acquisitions? What are loan periods, recall and save policies? Which categories of materials do not circulate? Are stacks open or closed? Are some materials in storage, and if so, what are the policies for selecting materials for storage? What is the quality of the stacks in terms of shelving accuracy?
5. *Bindery operation*: What is the binding policy? Is the public notified of material at the bindery? How long is material unavailable?
6. *Reserve area*: What is the reserve policy? What is the size and nature of the reserve collection?
7. *Other elements which might make the library easy or difficult to use*: What is the nature of the library's graphics, handouts, tours, library instruction, specialized classes?

As can be seen from this description, the model can be designed to deal with a very specific level of detail. While the remaining elements will not be described so specifically, detailed elements can easily be drawn from the earlier sections of the paper.

The second section of the model, then, would deal with external factors which might influence use: publishers' marketing practices, publishers' selection practices, publishing practices such as length of volume or length of article accepted, shorter print runs, etc. The third part of the model would explore: (1) knowledge and its nature: for example, is publication increasing exponentially? and (2) information use and transfer: how do people do research, how do people become aware of new research, how is past research integrated into new research, what types of users are there, and how might their use patterns differ? The remainder of the model would be devoted to a variety of techniques designed to detect user patterns consistently: for example, citation studies, and when and where they are applicable; circulation figures, and when and how they might be analyzed; and journal use, detected either from circulation figures or from some other technique for those collections where journals do not circulate.

The model including elements such as these could be constructed by a combined task force of librarians and researchers to be applied in the individual library, but designed so that it might be applied over a variety of libraries, with information then fed into a larger analytical body. The model would include not only standard descriptive elements so that types of libraries could be ascertained, but also standard definitions and outline techniques for gathering and analyzing use data. It would further include standard guidelines for costing out various acquisition, storage and processing decisions so that trade-offs could



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also be evaluated financially. Finally, it would provide guidelines for altering statistic-keeping practices in order for standard statistics to be implemented in a library and then brought together on a more comprehensive scale.

Once the model is constructed and tested, its application would not only become part of the library's ongoing operation, but it would also involve librarians and researchers in other sorts of information gathering activities as appropriate, particularly in the behavioral sciences and information sciences aspect of the question. Results would regularly be analyzed within the local library context, and those results and analyses passed on to a larger analytical body for analysis and possible further refinement of the model. Implementation of this model would provide not only more sophisticated management of library operations, but also information essential to the understanding of how libraries are used and how information was used.

### **Conclusion**

In conclusion, while the practical results of the obsolescence research done to date are of little value or use in daily library operations, many of the points under consideration are vital to ensuring the viability of library operations and are worthy of new consideration. Moreover, the critical nature of today's library world makes it imperative that librarians attempt a new approach to the management of library operations, including the investigation of the essentials upon which library service is based. The construction of a series of comprehensive models which can combine research with a library's ongoing activities will begin to produce the information, data and quality library service which can ensure that libraries continue to play an active role in the information transfer process. If nothing more, the obsolescence research done to date demonstrates that research must meet reality, and it is now incumbent upon us as librarians and researchers to ensure that that meeting is cordial, provocatively positive, and enhancing.

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