

very great cost to provide in computer files data bases from which hard copy may be produced, as well as a great variety of computer-manipulable services.²

Experimental work with computer-assisted and fully computer-based composition also continues in the area of the primary journals, in the interest of greater cost effectiveness. An increasing number of ACS journals is now in regular production using such advanced technology.

Studies are now underway to examine the effectiveness and acceptability of a dual-journal system.⁴ This would employ a summary journal to provide short versions of the papers, aimed at individual use, while an archival edition of the journal would contain the full text of the papers, including experimental results. With the development of such a system, it is likely that the full archival text of the individual papers may also be ordered on the basis of selection from reading the short papers in the summary journal.

While all of these forms of communication progress are giving us better services, we continue to be faced with the economic problem of maintaining the base of the system, the costs which we have described as those for the first copy. To help to support these, and yet also to serve individuals and libraries that would be inconvenienced by direct purchase of our journals or related services, we have proposed and continue to support the idea of a royalty clearinghouse for photocopying

which would allow users to receive copies of the desired papers for a payment that would cover an appropriate share of the first-copy cost. For those getting hard copies from us, subscriber costs would pay their share of first-copy plus the cost of printing and delivering. This combination would provide for the support of the developing ACS communications system, and could be refined through experience to support future costs as the entire system becomes increasingly machine based and moves toward complete on-line service.

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Copyright Impacts on Chemical Education and Resource Libraries†

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Stringencies in library budgets and the increasing costs of both journals and books have caused funds to be shifted away from the latter, but not sufficiently for libraries to keep pace with the starts of new journals. Increased emphasis is being placed on interlibrary loans, chiefly photocopies for journal articles, and on the rapid development of library networks and some pooling of holdings. If lending libraries were to collect copying royalties for publishers, the borrowing libraries would very likely have to pass these on to users.

Section 108(g) (2) of the pending copyright-revision bill (S 22) proposes a prohibition of "systematic reproduction and distribution" without copyright-owner permission. The main source of contention is the following. Resource libraries of all types over the past ten years, and more, have utilized "fair-use" photocopying in interlibrary borrowing and lending under what appears to them to be a legal interpretation of the existing law. The interlibrary-loan networks that continue to develop are an integral part of the resource-library structure, and it can be argued on their part that these networks have provided and made more available to the citizens of the United States the resources of the research libraries.

Publishers, on the other hand, believe strongly that these network systems, that is, their use of photocopies in their loan system, should provide copyright payment whenever a copyrighted document is copied and sent to another library and

thereby used by a user in or through that other library.

Copying in lieu of interlibrary loan presently involves almost exclusively journal articles. Libraries generally prefer to send a photocopy of a single article when it is needed by a scholar in another city whose library does not have it, because this is much more efficient than it would be to mail a bound volume of the journal containing a whole year's issues merely to satisfy a user's need for a few pages.

The use of interlibrary-loan systems has been accentuated by the rising cost of books and journals which libraries purchase. For-profit and nonprofit publishers both maintain that declining revenues have resulted, because of declining subscriptions, and furthermore that declining subscriptions are not solely a function of price, but are also due to the fact that interlibrary-loan systems will make material available to a user who otherwise might subscribe to the periodicals.

The real question is: Who pays? Should the publisher pay if his assertion is correct that he is losing income due to interlibrary loan? Should the libraries pay? If so, how should they pay? Should the user pay? Clearly there is no answer

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here that is completely logical. Let us therefore probe the problem in more detail from the viewpoint of chemical education and resource libraries.

It has been my privilege to have available to me when preparing this talk an excellent recent survey¹ conducted by Bernard M. Fry, Dean of the Graduate Library School of the University of Indiana, under a grant from the National Science Foundation. A wide variety of questionnaires on library-subscription practices were completed by academic, public, and special libraries. It would be impossible here to review this entire report. However, certain very interesting conclusions are clear from this massive data base.

Libraries in all categories have had some budget increases. Specific figures for academic-library budgets range from 4 to 8%. On the other hand, the price of books and journals increased anywhere from 10 to 15%. All libraries took similar action; essentially, they decided to reduce expenditures for books and to continue to take serials or periodicals insofar as possible. All libraries instituted other cost savings in order to survive.

It is interesting to read the conclusion from this report on the cost-effective measures reported as taken by libraries during the five years surveyed—the period 1969 to 1973.

"Academic libraries report the heaviest incidence of implementing such changes, with about 3 out of 4 reporting libraries reporting activity (cost saving), and with little deviation based on size. Public libraries generally report less such activity, with the smaller public library (perhaps hardest hit) reporting the greatest activity. By contrast, in the special-library field almost twice the percentage of larger special libraries report activity, with the smaller special library reporting the least activity of any sample population. It may be that, in industrial and governmental budgeting, the expenditures of a small library are not large enough to warrant the scrutiny and cost-reduction pressures which larger special libraries appear to feel and to which they react."

I also quote a conclusion from this report entitled, "Medium Percentage Increase in Number of Periodical Subscriptions—1969 to 1973":

"Periodical subscriptions continued to grow in all categories during the period 1969–73, reflecting an attempt by libraries to keep up with periodical requirements, even at the cost of transferring funds from the book budget, as reported elsewhere. However, the tabular data clearly indicate a reduction in the rate of increase between 1969–71 and 1971–73, and later statistics for 1974 and 1975, if they extended these trends, might in fact show some decreases. In any case, even the acceptance of the conservative journal growth rate of 7% per year would yield a cumulative 1969–73 increase of over 31%, and no respondent category meets this criterion."

Also informative is the conclusion entitled, "Periodical Additions and Cancellations, by Type of Library and Strata". As might be expected, large academic libraries are most heavily affected by periodical cancellation requirements, with other libraries generally falling into line by strata. Of particular significance is the sharp increase in cancellations indicated over the reporting years for most of the reporting strata. While the impact of 67 cancellations in large academic libraries during 1973 is difficult to evaluate, the trend lines established would indicate far greater cancellations for 1974, 1975, and beyond, and these trend determinations need to be pursued.

"The rate of periodical additions is decreasing for most strata, particularly larger academic libraries. While new subscriptions still sharply outnumber cancellations, it does not appear that new-subscription policies are keeping pace with even conservative estimates of the start of new journals, and the ratio of new subscriptions to cancellations, which for the

largest stratum of academic libraries was 55:1 in 1969, 14:1 in 1971, and 7:1 in 1973, is continuing to narrow.

"Large special libraries represent the only deviation from this trend, although the reporting population is small."

What is clear from all of these data is that sufficient money is not available in libraries, and particularly in academic libraries, for maintaining their previous programs for the purchase of periodicals. The conclusion is inescapable.

The Fry data also give us an idea of a mean percentage increase in subscription rates to libraries for all journals by types of publisher and discipline.

"Commercial publishers showed the greatest increase rate between 1969 and 1973, a differentiation even more clearly established by median rather than mean figures. However, the annual increase of between 10% and 11% from the previous year's base is less than that indicated from other surveys, and it may be that foreign publications, which bore the brunt of both inflation and dollar devaluation, may account for a large portion of the difference. Other categories of publishers report increases of smaller dimensions, although, except for the other not-for-profit sector (annual increases of 7%) they do not differ greatly.

"By discipline, pure science shows the greatest increase (an annual 10.5%), followed at some distance by social science (9%) and applied science and technology. The humanities indicate the smallest increase rate (8%).

"Since all of these statistics for domestic publishers of scholarly journals yield lower increases than those reported as experienced by libraries, the impact of foreign subscription prices, particularly for academic libraries (foreign periodical rates are subject both to inflation at the country of origin and dollar devaluation), should be investigated as a follow-on to this study."

Because of these trends, libraries have tended to gravitate toward interloan and network activity, as mentioned. Indeed, the Fry report gives us for the first time some really good data on the volume of borrowing and lending, as well as the effect of availability of periodical materials for borrowing.

"Virtually all reporting libraries participate in the regular interlibrary-loan code program, with the only exception among some small special libraries, perhaps too small to bother. Participation in consortia and networks increases sharply with the increased size of the library, and there is no appreciable difference between participation levels of academic, public, and special libraries, particularly at the upper end of the stratum. It would appear clear that the appeal of such consortia and networks is universal, and reaches all kinds of libraries.

"While better than half of the libraries reporting indicated that borrowing had no impact on their periodical selection and renewal policy, approximately 40% in all strata reported an impact. Moreover, that impact appears to be larger for larger reporting libraries, with more of these reporting multiple actions of dropping duplicates, dropping single subscriptions, and deciding against adding subscriptions. The total percentages of these activities can exceed the total which reports activity, since more than one category can be checked. The category which reports addition to periodicals holdings because of the unavailability of adequate borrowing capability shows a marked decrease trend for larger libraries, which seems to indicate greater activity on their part in becoming aware of opportunities for borrowing.

"Public libraries report less impact on their periodical holdings because of borrowing activities, with less than 1/3 reporting such an impact, a figure which is remarkably consistent regardless of size of library. Undoubtedly, this is partly true because public libraries carry fewer periodical subscriptions to begin with. However, some impact is clearly

evident, and it will be significant to watch how this trend continues to develop in future years."

For academic libraries, the data show a consistent increase in items borrowed, as well as in periodical items borrowed. An attempt was made in the questionnaire to differentiate between hard-copy and photocopy borrowing, but the responders were not sufficiently able to report the distinction. Libraries which themselves have large periodical holdings are also the libraries which borrow more, and this indicates a greater level of activity. In fact, the median for 1973 for libraries holding more than 5000 periodicals represents 20 times the borrowing activity reported for libraries with under 1000 periodicals.

Special libraries, in both reporting strata, show an increasing trend in borrowing, both for all items and for periodicals, from 1969 to 1973. Moreover, as with academic and public libraries, larger libraries borrow more, despite their own more extensive collections.

As for academic-library statistics, the figures for public libraries for each stratum indicate an overall increase in borrowing for all items and for periodicals. The trend in upward borrowing is clear, both from median and mean statistics. The pattern established for academic libraries which indicates increased borrowing even with increased holdings is not clearly established for public libraries. Public libraries (serving larger populations) tend to borrow more books but fewer periodicals.

The larger the libraries the more they both borrow and lend. However, larger libraries, as expected, do more lending than borrowing. For the smallest stratum libraries, medians indicate that between three and five items are borrowed for each one loaned. For the largest libraries reporting, lending exceeded borrowing, but never by even as much as 2 to 1. The uninterrupted increase in both borrowing and lending activity from 1969 through 1971 to 1973, regardless of the size of the reporting library, is clearly indicated.

Do libraries seek permission for lending activities from the publishers? I quote from the report:

"The most significant statistic in this table is the refusal of reporting libraries to answer the question, since it is unlikely that failure to reply would be based on not knowing. In no case did the willingness to respond exceed 10% of the sample. Since, as seen by the N numbers, the actual number of libraries which reported seeking permission in each category is small, the distribution which is reported cannot be considered significant."

There is another major point of contention, and that is the question as to whether the library actually saves money through sharing of resources by networking. It is maintained by the large academic libraries that this is not so, and I quote recently from Frederick H. Wagman, Director, University Library at The University of Michigan:

"It is unfortunate that the recent emphasis in library literature on the sharing of resources through networking has apparently misled publishers and authors into thinking that any library can eliminate the purchase of a journal or book that it needs with any frequency by depending on another library. No library finds it cost-effective to borrow, or purchase photocopies of, articles from any journal if articles from the entire set of that journal will be used six or more times a year. Moreover, interlibrary loan is an awkward process that involves delays, correspondence, bookkeeping, and high cost and is generally disliked intensely by both scholars and librarians. It is, however, our best means of giving access to information to someone whose own library does not have the publication containing it because that publication is very rarely if ever used,

or because it has disappeared from the library. Almost never are such publications available for purchase."

Of course, not all library networking involves this type of resource sharing. Some university and other resource libraries are actively planning to pool at least portions of their holdings in a few central collections that can be maintained by single subscriptions. Photocopies from the Lending Division of the British Library are being ordered increasingly by U.S. libraries. Library networking is under intensive study here and abroad; some of its connotations appear in context in a recent review of copyright developments.²

I return to the question of: "Who pays?" One thing is clear: if prices of books and periodicals continue to increase at the same rate as they have for the past two years, it is inevitable that additional subscription losses to libraries will result. It is absolutely clear that academic budgets will not rise on an average of more than 3 or 4% per year for the next three years, at least. Funding of public libraries will follow a similar trend. Government libraries might be in a slightly better position; however, this statement must be regarded as a tentative conclusion.

In universities, traditionally, faculty and students have used their libraries without paying special fees. One option could be to consider instituting such special fees, perhaps even built into tuition, although it should be said that this would be resisted by both faculty and students. It may seem that this option is not directly germane to the copyright problem, but it is related because it governs income to the libraries and would thereby help to govern periodical acquisition.

For funding the interlibrary-loan systems, who are the possible payers: (1) the lending libraries, (2) the borrowing libraries, or (3) the actual users of the documents? If a copying royalty were to be paid, the best control could probably be exercised by the lending library when it photocopies the article. Obviously, the lending library would then insist that the borrowing library pay this royalty charge, and the borrowing library would in turn pass that cost on to the user. The publisher would ultimately receive a royalty for the photocopying, minus collection-system expenses.

If such a scheme did work, and there is support for it, it is likely that there would be some curtailment of interlibrary-loan activity, at least initially, and it therefore can be argued that publications, in general, would become less accessible to the citizenry of the United States. What is clear at the present time, however, and it must be recognized by all, is that neither the lending nor borrowing library will be able to pay—it must be the user.

It is not my purpose here to draw a conclusion or to solve this problem. As a member of the American Chemical Society who has been vitally interested in its publication program for almost two decades, I want to see the publishing of scientific journals remain healthy and intact. As a member of the academic community, I believe that it is imperative that the major resource libraries provide information to the community at local, regional, and national levels. Truly, this is a serious dilemma, and a problem that must be approached with less emotion and more rationale.

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