Office Machines and Appliances

JEWEL C. HAR DKOPF

How many libraries are using office appliances and are they using them to perform the conventional office operations for which they were designed, or are they adapting them to perform library routines?

In 1940 the A.L.A. Bulletin carried an article entitled, "Equipment and Mechanical Devices Adapted to Use in Libraries," in which the author listed types of equipment which were efficient but not widely used in libraries. The items included floor coverings, exhibit cases and lighting devices, as well as duplicating machines, card sorting systems, and smaller gadgets like book-clamps, and pasting machines. The article included a list of institutions using each item. If such a list were prepared today, would it be very much longer?

In 1941 a questionnaire was sent to nineteen of the larger libraries in California for the purpose of surveying the existing practice in the use of modern mechanized equipment. Would a similar questionnaire sent out today bring to light much wider use of office appliances?

From an examination of the volumes of Library Literature from 1940 through March 1956 under the headings: Mechanical aids, and Machines and the library, it appears that very few librarians are inclined to write about the mechanization of library routines, if indeed they have adapted office appliances to library needs. From 1940 through 1945 only fourteen articles were listed; from 1946 through 1954 there were eighty-four articles. Among these eighty-four it was noted that more than one third dealt with either punched cards or electronic machines.

There is a tremendous amount of literature available detailing the obvious advantages of using office appliances in office routines, and describing the saving of labor and time and the increase in output. In the March 1956 issue of The Management Review the following statement appeared: "Estimates of the current shortage [of office workers] range from 600,000 to 1,000,000. In large cities the search

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for white-collar personnel is all but frenzied. Smaller urban centers are caught in the squeeze too."

Most librarians are well aware of this shortage of clerical assistants, and many have been examining clerical routines with a critical eye to determine where labor savings could be effected.

One of the largest items of expense in library operations today is the cost of personnel. But the prevailing scarcity of library workers frequently presents a more serious problem to the library administrator than the finding of adequate funds for the salaries and wages budget. It is to be expected, therefore, that the trend towards mechanization of library operations with modern, efficient office appliances will proceed with an increased impetus in the years immediately ahead. And it may be presumed that the selection and use of appropriate machines will receive the most careful consideration of library administrators so that library operations may be accomplished efficiently at minimum labor costs.

More and more articles are being written by librarians who have put machines to use to save time, to promote accuracy, or to eliminate work that is monotonous in character. In the sharing of such experience, reference is usually made not to such "old standbys" as typewriters, adding machines, calculators, voice recorders, and similar types of equipment used in the performance of ordinary office routines, but rather to variations of use, adaptations peculiar to libraries, for example, the use of dictating machines in audio charging of books to borrowers. Today's alert and progressive library administrators are eager to know all the details of imaginative and ingenious applications of office machines made by their colleagues. There is a growing realization that considerable versatility and tremendous developments in this area lie in the very near future for all libraries.

The need for the mechanization of a library routine should never be taken for granted. Nor should one accept the present method, the job as it is performed, without question. No librarian should ever decide to buy an office appliance because another librarian extols its value to his institution. Each must ask himself: Is the machine really needed in my library?

Perhaps the work itself could be eliminated, simplified, re-scheduled, or altered in such a way as to eliminate the necessity for mechanization. If it is determined that the operation is essential, some thought should be given to the possibility that the work is only temporary rather than permanent. If it is permanent, it may be possible to do the work by some simple non-mechanical means. An excellent example
is the practical device known as the slide rule, which is rapid, inexpensive, and sufficiently accurate for many purposes. It is not wise to be carried away by a machine's versatility or special features; they may have little or no application to the operations of the library, but will be included in the price of the machine.

The librarian who is contemplating the purchase of office appliances for their normal use in connection with regular office operations or for special applications to procedures peculiar to libraries will need to consider which of the following advantages of properly selected machinery are to be gained:

1. Reduction of costs
2. Reduction of monotony
3. Reduction of physical fatigue
4. Improvement of appearance of finished work
5. Improvement of quality of work
6. Securing of better control
7. Reduction of peaks and bottlenecks.

Mechanization of a library routine is often an invaluable aid in cutting costs but, particularly in the small library, it is important to remember that a machine requires a sufficient volume of work to effect lower unit costs. To be advantageous, time saved, if not applied to other essential library work, should result in a reduction of staff. If the time saved is simply dissipated and spread over other routines, there are no economic benefits.

If the primary goal of mechanization of a particular operation is to achieve a reduction in costs, the library administrator will necessarily have to make a comparative study of all costs involved in the operation as presently performed and those that will apply under the proposed mechanization. Having calculated the amount of probable savings, he would be well advised to check his results with libraries which have made similar conversions and who may have comparative cost figures based on actual experience.

Office machines, like other costly equipment acquired by libraries, must last for many years. That is why it is particularly important to make the decision to purchase only after the most careful consideration. Among other things, the final decision should be based on advice from librarians who have had experience with such equipment, consultation with manufacturers' agents, and a thorough inspection of competitive models. Apart from facts relating to the construction, operation and maintenance of the machine under consideration, the
competent sales representative may be counted on for information regarding special features and optional equipment. Any information he might have about imminent major improvements to be made in the current model may prove of particular importance. The possibility of rapid obsolescence of a machine soon after purchase is a serious matter, and any indication of such a possibility would suggest the wisdom of deferring the purchase for the time being.

The office appliance firm's representative is usually agreeable to arranging a trial period and willing to cooperate in a careful testing of the machine in the operation in which it is to be applied. Much of the uncertainty concerning the suitability of the appliance under consideration can be resolved in this vitally important part of any proposed purchase.

Whenever feasible, it is desirable to arrange a demonstration of the machine before interested members of the library staff. However, this should be done only after careful planning and preparation. In this connection, it is important to make sure that the demonstrator has not only a thorough knowledge of the machine and its operation, but has acquainted himself also with the problems peculiar to the particular operation in which it is to be used.

The choice of an office appliance, the particular make or model, will be influenced by a number of factors. Any one of the ten factors suggested in the questions listed below may be of dominant importance and, therefore, might justify the selection of a particular type, make or model of office machine.

1. Does it have the specific features to meet the requirements of the operation to be mechanized?
2. Does it have desirable flexibility or adaptability to meet special needs of other operations?
3. Will it improve service to library users?
4. Will it increase the output of the operation?
5. Will it improve the quality of work performed?
6. Will it reduce the drudgery involved in the operation?
7. Will it reduce costs of operation sufficiently to offset the expenditure within a reasonable period?
8. Does it involve special problems in the training of operating personnel?
9. Is it free from special problems of supervision, operation and maintenance?
10. Is it assured of acceptance by staff members?
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Since most office appliances represent expensive, long-term investments, final decisions concerning purchases usually rest with the chief librarian, who may be expected always to keep in mind the best interests of both the library staff and the public it serves. His individual preference will ordinarily not enter prominently into the selection of office appliances. But he will make sure that in the planning for the mechanization of a library operation the welfare and morale of the staff have received full consideration.

From the point of view of efficiency and cost-savings, there are no disadvantages involved in the mechanization of library routines, if the machines are carefully selected. In this area, library administrators' original sin derives from an indiscriminate enthusiasm for mechanization.

Office machines can be properly maintained only by considering all service factors together and planning their control. The factors involved are: (1) control of machine adjustments, (2) control of wear and mechanical condition, (3) control of lubrication, and (4) control of machine clean-up. Generally, the manufacturer has inspected and tested the machine before making delivery. When it arrives at the library, little concern needs to be felt as to its mechanical condition, but attention should be given to proper adjustment, lubrication, and clean-up procedures. This is the time to set the pattern and to establish standards for the control of the machine which will assure efficient operation in regular production. Each operator should receive full instructions regarding the proper operation and maintenance of the machine and a supervisor should see to it that the manufacturer's instructions are carefully followed.

In the matter of providing satisfactory machine maintenance, a library usually has a choice of several plans or combinations of these. Many manufacturers or service agencies offer a service contract, at a specified annual charge, providing for periodic servicing of the machine and stating conditions and rates applying to special service calls. A library may decide, of course, to call in a service man only as the need arises, but, in the long run, the cost of this plan may exceed that of a regular service contract. If the library is so fortunate as to have on its staff help with the necessary mechanical know-how, it can provide its own maintenance service and, in this way, keep maintenance costs at a minimum and also avoid the loss of time, in case of a minor breakdown, incurred while waiting for an outside service call to be made. The choice of plan naturally will be determined on the basis of which one will come closest to
providing uninterrupted service at the lowest maintenance cost.

There are many answers to questions concerning depreciation, what estimated rate of depreciation should be used, and when it is economically sound to purchase a replacement. The most commonly used rate of depreciation is ten per cent, or a period of ten years. In this connection, Bulletin F of the Internal Revenue Bureau, which gives the estimated average useful life of office equipment and machines, will prove useful. According to it, the life expectancy of selected items is as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Life Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Files</td>
<td>15 years</td>
</tr>
<tr>
<td>Office machines:</td>
<td></td>
</tr>
<tr>
<td>Adding</td>
<td>10 years</td>
</tr>
<tr>
<td>Billing</td>
<td>8 years</td>
</tr>
<tr>
<td>Bookkeeping</td>
<td>8 years</td>
</tr>
<tr>
<td>Dictation</td>
<td>6 years</td>
</tr>
<tr>
<td>Typewriter</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Usually the cost of the machine is written off in a constant yearly amount. However, in some instances thirty per cent or more is charged off at the end of the first year and smaller percentages each succeeding year until the full amount is absorbed.

The library administrator should determine replacement schedules so that machines will not be kept beyond their useful life. In this connection, the question of trade-ins needs careful study. Some over-all policy, allowing for exceptions in special circumstances, should be adopted in each library, based upon individual circumstances. The decision regarding a trade-in is influenced by three factors:

1. Availability of funds
2. Expected cash savings resulting from the installation of a new machine. Will these savings pay for the net expenditure within two years?
3. Difference between the accrued net depreciation and operating expenses; that is, the net (present value minus trade-in) should be less than the cost of repairs.

A complete annual inventory of all office machines should be carried out. For this purpose an inventory card file, which includes a separate card for each item of office machinery owned by the library, is recommended. The entries in the file should be under item, e.g., typewriter, followed by the name of the manufacturer. In addition, the card should state the operation for which the machine is used, date of
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manufacture, model and number, location in the library, date of purchase and price, maintenance record and expenses, and the inventory number corresponding to the one put on the machine at the time of purchase.

The balance of this article will be devoted primarily to descriptions of office machines which are considered useful in the performance of library routines. The purpose of this presentation is intended to broaden the reader's knowledge of modern office machines, but a detailed account of the different types, styles, sizes and models of the machines which are on the market today will not be attempted. Rather, it will offer a summary outline of some of the important kinds of machines and their functions.

Accounting machines are most useful in eliminating manual operations relating to the following records and procedures: (a) accounts payable; (b) accounts receivable; (c) payrolls; (d) analyses of costs and purchases; (e) preparation of general ledger and general journal; (f) preparation of rapid, accurate accounting facts; (g) posting of checks and deposits to ledgers and statements; (h) specialized applications for municipal offices (i.e. public libraries reporting to city government).

A complete bookkeeping machine produces multiple records with mechanical proof for every entry, instantly computed account balances, and automatically accumulated account control figures.

In selecting an accounting machine it will be necessary to consider four types:

1. Single-print, which allows ledger card and invoice to be prepared simultaneously by using carbon paper.
2. Multiple-print, in which the ledger card and statement are placed side by side in the carriage, the machine posting to the one, and then moving over and printing the same information on the other.
3. Flat bed, characterized by a flat printing surface which permits invoices and ledger cards to be inserted.
4. Window plan, designed for windows or counters by employee operating machine in a standing position.

The question as to whether a bookkeeping machine should be purchased should be answered by comparing the cost of manual posting, billing, and preparation of payroll records, with the cost of performing these functions mechanically (usually at a rate of 80 to 100 accounts per hour). Some authorities say accounting machines should be purchased when the number of daily transactions exceeds
200. However, the use of small bookkeeping or posting machines for
the preparation of statements and ledgers has reduced the time for
these clerical operations in organizations with no more than 50 to 60
daily transactions.6

In the Brooklyn Public Library an accounting machine was pur-
chased after it was determined by the bursar that the machine would
save staff time. An increase in the volume of financial records had
made the saving of staff time a necessity. By combining three opera-
tions into one (advice of payment, voucher, and check), and by
mechanizing the preparation of the earnings records for all employees
the accounting machine provided a solution to a very real problem.
According to the chief librarian, "The cost of the machine has already
been made up by the salary savings involved and we have reaped
an additional benefit of better and clearer accounts since the recording
is done in one operation." 6

Calculating machines are little more than highly developed adding
machines. There are two types; (1) key-driven, in which the mere
depression of the keys causes the machine to operate; (2) rotary, in
which, after the numbers on the keyboard are depressed, an activating
key or crank must be operated before the machine will calculate.

Purchase of this machine is justified whenever any of the following
tasks occur regularly and with some frequency: (a) preparing pay-
rolls, for multiplying hours worked by the rate; (b) preparing stock
room inventory figures, for multiplying unit cost by quantity; (c)
computing percentages, as required in figuring per cent of increase or
decrease in circulation, registration, book stock, expenditures, etc.;
(d) determining unit costs.

Multiplication and division computed mentally are slow processes
and liable to error. Where the processes of computation like those
mentioned above must be performed as a regular routine, the purchase
of a calculating machine is justified.

Dictating machines can be used to record words in such a way that
they may be retained permanently or temporarily for later use or
transcription. The record may be in the form of a wax cylinder, plastic
belt, plastic disc, plastic tape, or metal wire. Machines requiring plastic
belts and discs seem to be in greater demand in recent years than
machines using the wax cylinder. The latter has the disadvantage of
requiring shaving after each use before it can be used again. When
comparing dictation systems, the per hour cost of discs, belts, cylinders,
etc., should be considered. Wax cylinders will take approximately
eight minutes of dictation; plastic belts will take approximately 30
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minutes; plastic discs on both sides, plastic tape, and metal wire units will take up to one hour of dictation.

A recent development in dictating machines is the recording machine to which up to 20 telephone-like microphones, situated in as many different locations, may be connected. Another method of dictating is the voice reporter dictation mask, with which the dictator speaks into a mask covering the mouth and nose. A comparative test made by the U.S. Navy gave the following results:  

<table>
<thead>
<tr>
<th>Method</th>
<th>Accuracy</th>
</tr>
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<tbody>
<tr>
<td>Shorthand</td>
<td>75%</td>
</tr>
<tr>
<td>Stenotype</td>
<td>80%</td>
</tr>
<tr>
<td>Voice reporting</td>
<td>99%</td>
</tr>
</tbody>
</table>

The selection of typewriters, hitherto a relatively simple problem, may become somewhat more complex as a result of certain recent developments. In 1941, the Pacific Northwest Library Association's Committee on Library Supplies and Equipment reported a study initiated by a typewriter manufacturer which had for its ultimate aim the designing of a typewriter especially for libraries. It was discovered that by adding ten special keys a typewriter could be produced which would meet the needs of all departments of most libraries.

A new standard typewriter featuring interchangeable type is likely to be of special interest to librarians. The innovation of interchangeable type is described as follows:

In making type changes, the typist never has to touch the type with her fingers, or remove work from the machine. Using a simple pair of tweezers, she removes the old type block, selects the new one, and snaps it into place. The secret of the method is a tiny spring retainer clip on each type block which snaps onto the type-bar; once in place, the character is as firmly fixed and perfectly aligned as ordinary type. . . . Foreign language characters, symbols, and punctuation marks will also be available to fill the typing needs of foreign legations, import-export concerns, and college foreign language departments.

This same article quoted above reports that all current and late models produced by this manufacturer can be re-equipped with special type-bars to hold the new interchangeable type faces.

Electric typewriters are recommended for operations where more than five carbons are regularly required, or if master copies for use in duplicating, as in the multilith or Xerox process, are frequently required.

Automatic typewriters should be considered if the library has a need fairly often for quantities of individually typed letters which are
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basically the same, but not identical, in content. This machine utilizes a roll of paper, similar to the player piano roll. When the letter to be typed has been coded into the roll, the roll is placed in the machine and the attached typewriter electrically types the letter with perfect accuracy. The roll can be coded to stop at points in the letter so that a typist may insert any variations from the form letter as needed. In libraries, in which similar, individually typed letters must regularly be sent out, as for example, in fund solicitation, in welcoming new members, and in announcing new gift books added to the collection, the automatic typewriter is most useful.

Attention should be directed here to a device which is often overlooked in selecting a standard typewriter—the ten key decimal tabulator, which enables the typist to indent to the exact position for typing columns of figures. Many users believe this feature will increase the speed of statistical typing for the average typist by fifteen per cent. This increase in efficiency may well justify the additional cost of about $30 of the tabulator.

A label typewriter is now available which handles four sizes of labels simultaneously on a split platen. Only the particular label being typed will revolve on the platen. This machine can be used as an ordinary typewriter without any changes whatsoever. Libraries will find this useful for typing call numbers on strips of various sized gummed labels.

Typewriters with extra large characters are also on the market. These are useful in the making of shelf guides, labels, directional signs, etc.

The Vari-Typer is useful in libraries for duplicating book lists, book marks, brochures, and other pieces of publicity. A variety of type fonts is available and electrically controlled impressions assure each character receiving uniform impact regardless of the operator's touch. Before purchasing comparisons should be made with the standard typewriter featuring interchangeable type.

Teletypewriters combine the features of the typewriter and the telephone with the additional feature of providing a written record of the communication. The charge for teletypewriter service is approximately half that for long distance telephone calls. This machine should be considered when a library must communicate frequently with libraries in other cities, when an immediate answer is desired, and where a written record of the communication is of value. The application of the teletypewriter network to interlibrary loan communication is described elsewhere in this issue.
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Addressing and embossing machines stamp or stencil information on large quantities of papers or cards in a fraction of the time which would be required if done by hand. They utilize a small metal plate or paper stencil on which the required information has been punched or typed. Metal plates are embossed with a graphotype or compotype machine. Paper stencils are prepared on a typewriter equipped with a specially adapted platen. Some libraries are using addressing and embossing machines for printing simple catalog cards, book cards, adult registration, preparation of employee time cards and payroll sheets, and preparation of bibliographies.

The sign writing machine is most useful in eliminating the hand lettering of printed signs for the library. Important in the selection of a sign writing machine is the consideration of the variety of type, and the quantity of each one selected. There is a wide choice of sizes and styles of type available. The Brooklyn Public Library has found three inch characters satisfactory for the largest and quarter inch for the smallest, but keeps a generous assortment of sizes in between. The advantages of this equipment are described by F. R. St. John as follows:

I think every library has the problem of handmade signs and posters. They are not only time-consuming for the average assistant but unless there is a person on the staff with special artistic ability most of the signs cry out that they are handmade. Our inexpensive equipment . . . produced during the fiscal year 1951-52 over 3,000 signs easily duplicating the same sign for each of our 50 units. It requires practically no experience to operate. We have found that the average intelligent part-time clerk can be taught to produce clean, good looking signs after a few hours of training.12

Papers placed in the rack of a folding machine are mechanically moved in such a way as to fold each sheet of paper in any of several different kinds of folds. There are eight basic folds most commonly used which most folding machines are equipped to handle: single, double, standard, "low" standard, accordian, "low" accordian, no. 6 fold for 6¾" envelopes, and baronial. These machines will fold at rates of 5,000 to 19,000 sheets per hour. They should be considered for purchase whenever a library has regular quantity distribution of publicity items such as book lists. If each week the library has occasion to fold sheets in quantities of a hundred or more, the purchase of a folding machine is probably justified.

Books, papers, bundles, boxes, or cartons placed in the rack of a
tying machine are tied mechanically about ten times faster than by hand tying. These machines are designed to adjust automatically to varying sizes of bundles or containers. Uniform, proper tension, the exact amount of twine and a secure, non-slip knot are assured. The convenience and efficiency of tying machines is appreciated particularly in binding divisions for tying into bundles periodical issues when assembling binding shipments and in branches departments for tying together bundles of library materials to be distributed to various branches and stations.

Any library administrator considering the purchase of new filing equipment which will increase production and reduce fatigue and waste motion would do well to investigate the rotating filing equipment.

Rotary files are designed for filing cards into sections of a rotating drum or wheel, combining features of compactness, accessibility and visibility. Both manually and electrically operated models are available. The desired cards are quickly located and placed within convenient reach by rotating the wheel. Rotary files are useful in work involving a single operator to work on files containing a large number of cards. A wheel with a 21 inch diameter has a capacity of approximately 5,000 3 x 5 inch cards, or approximately 4,000 4 x 6 inch cards.

In conclusion, it must again be emphasized that there can be no substitute for the analytical approach to the problem of mechanization of library routines. The librarian must arrive at a clear conception of his objectives with respect to mechanization. He must study carefully the present work situation and the routines involved in the operations which may lend themselves to effective mechanization. At this stage it is less important to be concerned about how the change will be accomplished than about what the change should be. In this the librarian can benefit by consultation with the staff members who perform the operation regularly, but in the end, it is his analysis and decision that will have to settle the question.

The mechanization of library operations is bound to proceed at an increasing pace, but as R. R. Shaw has so aptly put it, "The question is not whether we will mechanize but rather at what level of sophistication of mechanization we will find ourselves ten or twenty years from now." 13

By itself, the machine will not bring the solution to the problem of easing the pressure of routine work on professional and clerical personnel. That can be accomplished only by fitting it most effectively into the operation to be mechanized, and in the adequate psycho-
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logical preparation of the staff, proper training of personnel in the use of the new machine, and intelligent determination of the use to which the time and labor saved are to be put, play an important part. It is this that J. M. Connor had in mind when he wrote,

When machinery turns the library into a whirling, clicking, mechanical robot, it is time to stop calling it a library. . . .

The installation of labor-saving devices should be encouraged, if the labor and time saved is converted into more services for more people, or better services. If an electric—or photocharger saves three to five man-hours a week, that's the time to start a part-time readers' advisory service. The use of an automatic addressograph or multigraph apparatus in the rapid reproduction of cards transforms two days per week of a typist's time into an afternoon assistant in the young adult room. . . .

For every machine installed in a library there should be clear evidence of time liberated to set in motion new ideas and new services, or more of the established services, to the community.

Today, many librarians are alert to the potentialities of mechanization with respect to the improvement of library services. In the words of M. F. Tauber, "Further improvements in the services which libraries can offer—on a large or small scale—await only the imaginative use of scientific management and the development of new machines and methods to implement new solutions to old problems." More of us should play an active and intelligent part in changing these potentialities into realities.

References

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