Cooperation Amongst the Science Libraries at Oxford University

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COOPERATION AMONGST THE SCIENCE LIBRARIES
AT OXFORD UNIVERSITY

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1. Summary

In a historical introduction which traces the development of the Radcliffe Library (1)* alongside the Bodleian Library (56) at Oxford it is shown how it took nearly two hundred years to establish a role for the Radcliffe as a science library. During this period, some of the science departments in the University of Oxford set up specialist libraries and from these beginnings has grown a very strong body of science departmental libraries. In spite of the richness and breadth of the literature collection in the University library nearly half of the scientific library resources in the University are devoted to supporting the departmental libraries. While some of these may, because of their unique holdings, be looked upon as specialist extensions of the main library, the majority of holdings duplicate the central collection. In order to ensure maximum inter-library cooperation, and in the hope that unnecessary duplication of stock and other library resources may be eliminated or avoided, a Science Libraries Advisory and Co-ordinating Committee (S.L.A.C.C.) has recently been established.

One important device to ensure the maximum benefit from the large collection of scientific serial publications (which includes all British publications deposited under the Copyright Acts) is the maintenance of a union catalogue which includes all holdings in fifty-four different science libraries (over 30,000 entries). To increase the effectiveness of this catalogue, an attempt is being made to set up the entries as a database on-line on a central computer. Those departments with terminals on the University computer network may be able to interrogate the catalogue by this means.

Experience in Oxford and elsewhere has shown that library automation is generally costly and difficult to justify on a cost-benefits analysis. The basic problem arises from the large databases which are accessed infrequently. One way of increasing their utilization is by sharing between several user libraries.

If this venture is successful it is hoped to extend the database to include detailed records of individual holdings, including lacunae. The addition of subscription data later on could lead to the development of an on-line automated serials handling system. Interest generated by these activities has led to the setting up of an inter-library working party to explore the feasibility of establishing a union list of scientific texts to include monographs and reports.

† The scientific department of the Bodleian Library.

* Numbers in brackets after the name of a library indicate that it is shown on the map of Oxford, Figure 1.
The Radcliffe Science Library (1) was founded originally in 1749 as a result of a bequest by Dr. John Radcliffe, a physician at the court of Queen Anne. He left forty thousand pounds to build a library, one hundred pounds annually to purchase books and an annuity of one hundred and fifty pounds for the librarian. At that time the Bodleian Library, refounded in 1598-1602, was flourishing and expanding steadily and much effort was expended on ways to put the Radcliffe bequest to best use for the University. The eventual solution which we see today was not implemented until one hundred and eighty years after Radcliffe's death.

In the year 1749 the Radcliffe Camera (55), one of the most renowned of Oxford buildings was completed and opened to house the Radcliffe Library and for nearly one hundred years it functioned next to the Bodleian Library as a general library with no clearly distinct objective. In 1811 the then Radcliffe Librarian, Dr. Williams, induced the trustees to restrict new purchases to scientific and medical subjects but it was not until 1860, one hundred and eleven years after its original foundation that the Radcliffe Library became firmly established as a science library. It was in this year that the scientific and medical books were transferred from the Radcliffe Camera to the University Museum in the Science Area. At the same time the trustees allowed the Bodleian Library to use the Camera as a reading room and provision was made for the Bodleian Curators to loan scientific books to the newly housed Radcliffe Library. The final act in this very early instance of scientific library cooperation occurred in 1927 when the Radcliffe Trustees gave the library and its books and endowments to Oxford University who placed it in the charge of the Bodleian Curators. The Curators responded by transferring all the post-1884 Bodleian works in Natural Science, Engineering, Mathematics and Medicine to the Radcliffe Library.  

3. The Oxford scientific community and library resources

In 1977, the author published A review of Oxford University science libraries. This report identified fifty-three science libraries located in the various science departments of the university (including fourteen in clinical medical subjects). A detailed study of the holdings of these libraries showed that eleven of them had significant collections of scientific literature not held in the main University Library (see Table 1). The origin and role of these libraries is discussed by Morgan in Oxford libraries outside the Bodleian.

The collection of data for entry in this table was greatly facilitated by the existence of a union catalogue of scientific serials in the University. This catalogue, which was published in hard copy format in 1971, has subsequently been maintained and up-dated in typed card format (5" x 3") and held in the Radcliffe Science Library.

The majority of the libraries in Table 1 are in relatively small biological science departments. Yet, in all cases they provide better coverage of their subjects than does the Radcliffe Science Library and their collections of literature are of vital importance for Oxford science. It is of interest to note that two of the listed departments support international bureaux - the Commonwealth Agricultural Economics Bureau (2) and the Commonwealth Forestry Bureau (19) - housed in the respective departments. The Alexander Library (29) supports the British Institute for Ornithology and the Cairns Library (12) supports clinical medicine for the Oxford region which serves a population of over two million.

The scientific community served by this group of libraries is large and...
Table I: Departmental libraries with important runs of science serials.

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>MAP KEY</th>
<th>NUMBER OF CURRENT SERIAL TITLES</th>
<th>Total subscriptions</th>
<th>Held only in department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics</td>
<td>2</td>
<td></td>
<td>778</td>
<td>293</td>
</tr>
<tr>
<td>Agricultural Science</td>
<td>3</td>
<td></td>
<td>238</td>
<td>22</td>
</tr>
<tr>
<td>Astrophysics</td>
<td>6</td>
<td></td>
<td>268</td>
<td>100</td>
</tr>
<tr>
<td>Botany</td>
<td>11</td>
<td></td>
<td>268</td>
<td>115</td>
</tr>
<tr>
<td>Ecology (Elton)</td>
<td>15</td>
<td></td>
<td>210</td>
<td>102</td>
</tr>
<tr>
<td>Entomology (Hope)</td>
<td>17</td>
<td></td>
<td>149</td>
<td>89</td>
</tr>
<tr>
<td>Forestry</td>
<td>19</td>
<td></td>
<td>940</td>
<td>218</td>
</tr>
<tr>
<td>Geography</td>
<td>20</td>
<td></td>
<td>219</td>
<td>12</td>
</tr>
<tr>
<td>Geology</td>
<td>21</td>
<td></td>
<td>153</td>
<td>82</td>
</tr>
<tr>
<td>Ornithology (Alexander)</td>
<td>29</td>
<td></td>
<td>326</td>
<td>150</td>
</tr>
<tr>
<td>Clinical Medicine (Cairns)</td>
<td>12</td>
<td></td>
<td>520</td>
<td>100</td>
</tr>
</tbody>
</table>

Total number of current science serials in Oxford which are not in RSL: 1,268

For Comparison:

<table>
<thead>
<tr>
<th>Radcliffe Science Library</th>
<th>Total</th>
<th>Purchased</th>
<th>Copyright</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9,000</td>
<td>2,500</td>
<td>6,500</td>
</tr>
</tbody>
</table>

Includes the various categories of scientists shown in Table II.
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>NATURAL SCIENCE AND TECHNOLOGY</th>
<th>CLINICAL MEDICINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff</td>
<td>450</td>
<td>400</td>
</tr>
<tr>
<td>Post-doctoral researchers</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>Students reading for science degrees</td>
<td>5,000</td>
<td>200</td>
</tr>
<tr>
<td>Total in residence</td>
<td>6,500</td>
<td></td>
</tr>
<tr>
<td>Former readers</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Visitors and external readers</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32,000</td>
<td></td>
</tr>
</tbody>
</table>

Table II: The scientific community served by Oxford University libraries.
includes the various categories of scientists shown in Table II.

Besides provision for academic staff, post-doctoral research fellows and graduate students, the university libraries provide a reference collection for first-degree students. Circulation is generally restricted to senior staff. The needs of junior members are partly satisfied by the college libraries which are excluded from the present discussion; but their role in providing a large source, mainly of standard textbooks for degree courses, is vital and must not be overlooked.

In addition to the readership entered in Table II the Radcliffe Science Library, as a library of last resort, provides back-up to the British Library Lending Division and the United Kingdom Atomic Energy Authority whose Harwell and Culham research establishments are within twenty kilometres of Oxford. Other significant users of the Oxford science libraries are the Oxford Polytechnic, the Oxford English Dictionary whose science editors carry out their research in the Radcliffe Science Library bookstack, and the science abstracters from Learned Information who abstract all the European scientific theses (circa 20,000 per annum) donated to the library by foreign universities.

4. Communications: present and future

A map showing the geographical distribution of the science libraries is shown in figure 1 (see next page). It will be noted that the majority are clustered near to the Radcliffe Science Library and all except the libraries in the clinical medical departments are within a radius of one kilometre. The key to figure 1 which identifies the libraries marked on this map is given in Table III. Communications are good. All the central libraries share a common telephone service within the university network with internal direct dialling facilities between all telephone extensions using a six-digit number (three-digit code + three-digit extension number). There is a messenger service for letters and small packages with twice daily collections and deliveries and the Bodleian Library operates a van which travels twice daily around the central area and could be utilized for the delivery of parcels.

It is unlikely that the need for inter-library collaboration would carry much weight or influence towards the provision of new communications facilities — except for those which could be financed by the libraries from their existing resources. Therefore, it is essential to keep under scrutiny the provision for communications for other purposes within the university.

The university computing service supports a hard-wired communications network which is capable of signal transmission at 9600 baud. This network is primarily to connect remote terminals to the research computers in the main university computer building. There is a possibility that the system could be used for information transfer between libraries and it is important in this context that the Radcliffe Science Library has been included in the network. Finally, there have been discussions on a possible closed-circuit video link between the central science area and the clinical medical site at Headington. This has been suggested in connection with the teaching of anatomy and physiology to pre-clinical students aided by live transmissions from the clinical departments. The existence of such a facility would make possible facsimile transmission between libraries for information transfer and document exchange. This would be much faster and more effective than possible at present through the telecommunications network.

5. Collaboration: motives and objectives

More than ever before there is a competition for scarce resources. Whereas during the economic boom of the 1960s libraries were able to expand at will
KEY TO MAP:

Radcliffe Science Library 1
Radcliffe Camera 55
Bodleian Library 56
Cairns Library (Clinical Medicine) 12

The other libraries numbered on this map are listed and identified in Table III. For ease of reference, the key number to each library is also given in the text after it is first named.

Figure 1. Map of Central Oxford showing location of the Science Libraries, the Bodleian Library, and the Radcliffe Camera.
Table III: Key to major Science and Clinical Medical departmental libraries.
and, in fact, enjoyed a climate of financial support and well-being never experienced before, since then cuts in research funding have been accompanied by a very strict control over library budgets during the 1970s. The smaller libraries have generally been the first to experience problems but the economies forced on library managers have affected all of them. The severest cuts in financial support in the U.K. occurred during the years 1974-76 and for Oxford science libraries this was particularly unfortunate as it coincided with the time when, after ten years of planning, an extension to the Radcliffe Science Library was completed which virtually doubled the capacity and potential of the Library. Apart from any other considerations, therefore, inter-library collaboration is essential in order to make sure that priority is given to the most important aspects of library provision. This is the first objective and it is stimulated by a powerful motive.

The Radcliffe Science Library and the Science departmental libraries all receive financial support from central university sources but by different routes as shown in figure 2. The significance of the cross-link (S.L.A.C.C.) between the Libraries Board and the Science Departments is discussed below.

In this context it is relevant to note that the financial expenditure of the departmental libraries is of the same order as that spent by the Radcliffe Science Library. This is demonstrated in Table IV which shows that the division of library funds between the science departments and the Radcliffe Science Library is roughly 40% to 60%. The departmental libraries are primarily concerned with the maintenance of core collections of periodicals and textbooks together with conference reports, preprints and reprints. They rely on the Radcliffe Science Library for major coverage of the world scientific literature; where this source is unable to meet their needs the scientists resort to the professional institutions in London and the British Library Lending Division.

6. Collaboration: means to an end

It has been postulated that the Scientific library service could be improved by achieving the following four objectives:

1. an increase in efficiency (whatever that may be in practice!),
2. the elimination of wastage and duplication,
3. the better utilization of existing stock, and
4. the implementation of agreed common objectives.

To achieve this degree of collaboration the University has set up a Science Libraries Advisory and Co-ordinating Committee, known as S.L.A.C.C., which reports to and advises both the Libraries Board and the Heads of Science Departments. The Committee has been in operation so far for just under one year. Even so, it has considered the following matters in a provisional survey of problems to be solved:

(a) the creation and maintenance of a union catalogue of newly acquired monographs,
(b) the updating and automation of the union catalogue of serials,
(c) the sharing of bibliographic resources,
(d) the disposal of obsolete or duplicate and unwanted material,
(e) the conservation of unique (in Oxford) holdings, both of serials and
Figure 2. Diagram showing the source and routing of library finance with the cross-link S.L.A.C.C.
### Table IV: Expenditure of the Science Departmental Libraries compared with the Radcliffe Science Library.

<table>
<thead>
<tr>
<th></th>
<th>1971-72</th>
<th>1975-76</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Staff</strong></td>
<td>44,300</td>
<td>80,700</td>
</tr>
<tr>
<td><strong>2. Periodicals</strong></td>
<td>30,800</td>
<td>64,300</td>
</tr>
<tr>
<td><strong>3. Books</strong></td>
<td>20,000</td>
<td>32,300</td>
</tr>
<tr>
<td><strong>4. Miscellaneous</strong></td>
<td>11,400</td>
<td>17,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>£ 106,500</td>
<td>£ 194,600</td>
</tr>
</tbody>
</table>

### SCIENCE DEPARTMENTAL LIBRARIES

<table>
<thead>
<tr>
<th></th>
<th>1971-72</th>
<th>1975-76</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Staff</strong></td>
<td>58,200</td>
<td>118,800</td>
</tr>
<tr>
<td><strong>2. Periodicals</strong></td>
<td>54,600</td>
<td>109,100</td>
</tr>
<tr>
<td><strong>3. Books</strong></td>
<td>26,900</td>
<td>15,100</td>
</tr>
<tr>
<td><strong>4. Miscellaneous</strong></td>
<td>16,300</td>
<td>28,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>£ 156,000</td>
<td>£ 271,200</td>
</tr>
</tbody>
</table>

### RADCLIFFE SCIENCE LIBRARY
monographs,

(f) the application of the Atkinson principle for a steady-state self-renewing library of fixed storage space.

The majority membership of the committee is drawn from the science faculties but also includes five librarians, viz. Bodley’s Librarian, the Keeper of Scientific Books, the Librarian/Co-ordinator for Clinical Medicine and two elected science librarians. The chairman is a head of a science laboratory. It is considered essential to have strong representation on the committee from the science departments; only in this way will the scientists be willing to cooperate in the necessary measures to ensure that their library resources are deployed to the best common advantage, particularly, when some measures may offer some of them an obvious disadvantage. The success of this new collaboration will depend on the extent to which solutions can be found or devised for the urgent problems and the speed with which these solutions are implemented. Scientists are busy people - as a scientist himself the author knows this - and they are the first to lose interest in and give up an unprofitable or unproductive enterprise.

7. Collaboration: the production of union catalogues

One of the most significant features of science library cooperation in Oxford has been the readiness of all departments to contribute to a union catalogue of serials. The original union list was planned by D.H. Boalch (Keeper of Scientific Books 1962-75) in three stages which have now been completed, viz:

Stage I To list all current serials in the Radcliffe Science Library together with other Oxford holdings of science serials according to the World List of Scientific Periodicals and supplementary data recorded in the Radcliffe Science Library card catalogue. This was completed in 1968.

Stage II To add to Stage I subsequent new serial titles received in the Radcliffe Science Library together with all serial titles, whether current or ceased, in 49 departmental libraries. This was completed and published in 1970 and comprised 15,000 entries.

Stage III To add to Stage II all ceased serials in the Radcliffe Science Library thereby completing the Oxford holdings of serials both current and ceased. The work on this was completed by Gill Cooper and Peter Warren in the summer of 1978 but has not yet been published. It comprises approximately 30,000 entries. The number of contributing libraries has been increased to 54.

Since the completion of Stage III, effort has been concentrated on devising economical means to publish the list. The records exist in two forms:

(a) punched paper tape in separate lengths, one for each entry; these are used to produce

(b) typed catalogue cards (5" x 3") which comprise the entries in the main serials catalogue which is located in the Radcliffe Science Library Entrance Hall.

Typical records are shown in figure 3, produced in May 1979 on a Friden Flexowriter. This shows clearly that the machine, now sixteen years old, is nearing the end of its life.

During the completion of the work for Stage III, developments in automatic
data storage and retrieval systems have taken place which make the use of electronic data processing a possibility. The fact that the Flexowriter tapes are in a machine-readable code makes this approach the more attractive. However, in order to obtain hard copy output either by lineprinter or in microform, a substantial amount of data transcription and computer programming is required. The main reasons for this arose from the fact that the existing records were individually recorded on short tapes with stop codes, diacritical marks, underlinings and carriage returns, part of a special character set for the Friden Flexowriter which needed transcription after input to a computer.

It was, therefore, decided to carry out a comparison of production costs by four different production methods, viz:

1. photographing the card catalogue,
2. production of master hard-copy on the Flexowriter. (This method was used for the Stage II publication),
3. transcription of the Flexowriter tapes to a continuous magnetic tape,
4. keying in the entries ab initio on a computer terminal.

It was noted that methods 1 and 2 would enable only a book catalogue to be printed whereas 3 and 4 could serve both for hard copy and microform editions as well as providing input to an on-line database. The latter is important and has influenced our choice. A comparison of the relative costs of generating a computer database by methods 3 and 4 showed that the approximate cost per entry was £0.03p for tape transcription and £0.14p for re-entering the data from a keyboard. A more recent measurement using an intelligent-terminal keyboard with full-editing capability has given a cost per direct entry of £0.07p excluding allowance for revising. Hence, method 3 was chosen.

The work of transcription and input to generate a master magnetic tape file is now nearing completion. It has been carried out on a Digital Equipment PDP 10
computer in the Oxford Nuclear Physics Laboratory by the Librarian, Penny Gledhill. The histogram in figure 4 illustrates the rate of production of the magnetic tape file for the Union List of serials.

Figure 4. A histogram showing the rate of production of the magnetic tape file for the Union List of serials.

of the file. It has not been possible to maintain a steady throughput since this project is accorded low priority for use of the PDP 10 computer. The high rate of input during the initial period in the summer of 1978 coincided with the availability of extra labour at a time when the computer was not fully used. Nevertheless, over the year the rate of creation of the file has been fairly steady and it is hoped to complete this operation by the target date of 31st July 1979.

8. Conclusion

Following the interest generated by the setting up of S.L.A.C.C. and moves to provide multi-access to the union serials catalogue, a working group of librarians has started to explore the possible creation of a union catalogue of monographs. This is seen as a parallel project to the serials catalogue. The union list of serials enables the whole collection in the University to be supervised centrally to ensure that unique holdings are not disposed of. A union catalogue of monographs could similarly contribute towards the conservation of unique items in the departmental libraries.

It has been our experience that a very considerable staff effort is required in the initial stages of planning the nature of the entries, their extent and what to include (or exclude); consequently, the possible uses to which the final catalogue may be put must be explored thoroughly to ensure that the
effort involved in creating the database is justified.

9. References


DISCUSSION

Mr. S. Westberg: In the 56 libraries that you studied, Dr. Shaw, at Oxford, what variations did you find with regard to availability to different groups of users?

Shaw: All of the libraries were set up for the benefit of the departments in which they were housed. The size spectrum varied over a factor of about a hundred. The largest library - forestry - is about one fifth the size of the Radcliffe Science Library whereas the smallest is a few metres of books. Access to the forestry library is completely open, whereas other libraries are restricted to staff in the department.

Westberg: What about provision of facilities for readers?

Shaw: About a quarter of the libraries provide seating accommodation up to UGC standards, but others have no seats or staff.