MICROFORMS IN LIBRARIES
the untapped resource?

Papers given at the National Preservation Office Conference
held 13-15 October 1992 in Birmingham

Organised by
THE BRITISH LIBRARY NATIONAL PRESERVATION OFFICE
as part of
THE MELLON MICROFILMING PROJECT

Sponsored by Kodak Office Imaging
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PREFACE

There are five essential ingredients for a good conference - quality speakers, crisp administration, wise delegates, financial viability and, less easy to define, an atmosphere which, from the first moments, encourages involvement, enjoyment and participation.

This was a good conference. For those of us who planned it and saw it happen it was very special indeed; those who attended, in large numbers, went away interested and even inspired.

Why hold a national conference on microforms in libraries? (It was not, many told us, the most exciting subject for a two day debate). Since the late eighties, the National Preservation Office has been coordinating a national microfilming programme generously funded by the Andrew W Mellon Foundation of New York. The programme is large, important and many stranded. From the beginning the National Preservation Office did not wish simply to be the agent for grant giving and the regulator of microfilming standards. For the programme to work and to matter in the long term, we had to address not only the mechanistic aspects of putting material on microfilm, but the human aspects too. Microform copies are not universally popular with librarians. Library users of microform are too often uncomfortable and frustrated with poor machinery and lack of good study conditions. There can be no one who actually prefers a microform copy to the original item.

But even at its least exciting, microform is our best and most economic form of substitution. At its best it offers high quality, quick and worldwide access to texts and safety from technological change. It was timely to put issues on the table, under the auspices of the Mellon Project. How were we treating users? What standards were applicable? How well were national programmes working? What comes after microform?

If microform was worth talking about, it was worth talking about properly. Many who would be interested to share experiences would not be able to pay huge conference fees. We wanted international as well as national speakers. We needed sponsorship.

It is customary for organisers to thank sponsors and for the reader to register it as simply good manners. But it is absolutely true to say that without Kodak this conference could not have happened. Their confidence in and support of the conference was total. They gave their pledge of money, speakers and backup at the beginning, then left the NPO to run the conference it wanted to run. Kodak colleagues attended, helped, contributed and were clearly more concerned in the success of the conference than in any quick and easy benefit to themselves as suppliers. To John Cox, David Wells, Kevin Wooldridge and Andy Pibworth sincere thanks are due.

The conference speakers and the chairmen and women were uniformly excellent. Reprinted here are papers from the majority of the sessions; a few which did not lend themselves to the printed format are not covered. An extra to the conference proceedings, a useful paper by Roger Broadhurst is also reproduced.

The smooth organisation of the conference was directly due to the hard work of the staff of the British Library National Preservation Office and the Register of Preservation Microforms. Valerie Ferris, then Mellon Microfilming Project Officer, now National Preservation Officer, stamped her own extraordinary brand of enthusiasm and order on every detail of the conference. Isabel Pickering and Craig Mitchell were on the spot and dealt effortlessly with all the hour by hour issues. Rachel Hart led the office team.
One conference and its papers made available to a wider audience will not change the role and image of microforms in libraries. But talking about the problems and opportunities will, eventually, do just that. And talking about it widely, as we did in Birmingham, not only with librarians but with archivists, suppliers and technical experts, will give added value and weight to such talking. The Mellon Microfilming Project continues to put good film in secure keeping for the future; through communication it is also achieving much more.

'Microforms in libraries; the untapped resource' marked the end of my time at the National Preservation Office. It was a memorable and deeply rewarding final event to a stimulating and fulfilling four year tenure at the National Preservation Office. It is a great pleasure to commend these papers to you.

Marie Jackson
The British Library
MICROFORMS: THE WHOLE PICTURE: ARE THEY WORKING FOR LIBRARIES?

Ann Matheson

Traditional microforms produced by microphotography have now been part of library function for over 50 years, ever since their introduction into libraries, and library service, in the 1930s. In the intervening years the two major branches of microform production - scholarly micropublishing and preservation microfilming - have blossomed both in North America and Europe. Scholarly micropublishing, in fact, was a testimony to opportunities for interaction between research libraries and commercial publishing long before the present cross-fertilization between public sector organizations and private companies became as fashionable as it is in the UK today. While scholarly micropublishing may of course, also fulfil a preservation function, preservation microfilming itself, on the other hand, has become largely the preserve of libraries. The major preservation microfilming programmes that have developed on both sides of the Atlantic have been aimed at the filming, for preservation purposes, of individual items in the research collections of libraries; and the initiative in setting up these programmes has often come from dynamic and enthusiastic librarians concerned about their collections, and the preservation of the national heritage.

While microforms were initiated in libraries in the 1930s, it is fair to say that until the 1960s they made relatively little real impact on libraries. This situation changed as the microform industry began to exert market pressure on conventional publishing. The 1970s heralded the advance of commercial micropublishing on a major scale amid predictions about what the consequences would be. We can all remember the confident assertions that microforms would replace books on paper: we can all remember those books that were published with titles like The End of the Book; and The End of Libraries.

But, of course, it did not happen: instead, microform publishing opened up another active and lucrative market that complemented, and supplemented, conventional book publishing.

The history of microforms in libraries has had its vicissitudes, and both in format and in volume, the collections of most libraries reflect these historical peaks and troughs. In the halcyonic days of the late 1960s and the early 1970s, when large-scale collection building was still considered to be a respectable objective for libraries, most major UK research libraries had the resources to expand the subject breadth of their collections, and to enhance the depth of their existing subject coverage. Major libraries began to subscribe to the scholarly micropublishing series that were issued by the micropublishers: more and more microform research collections were purchased by libraries during this heyday period of microform acquisition. By the 1980s, however, the start of the decline in the level of library budgets had reversed this situation. As acquisitions budgets tightened, libraries had to begin to make difficult decisions between purchasing current materials and acquiring retrospective materials: as a consequence, the attractiveness to libraries of purchasing major microform research collections declined in the face of the need to spend the available resources on the best representation of new publications. This, in turn, had an adverse effect on scholarly micropublishing. Research collections of printed books and manuscripts have been described as ‘the glamour segment’ of scholarly micropublishing. They are closely dependent on the economic well-being of libraries: as one publisher said recently in the United States, confirming this close dependence: ‘When you sneeze, we catch cold. When you catch cold, we catch pneumonia’. In UK libraries in the 1990s we are all catching cold: the majority of libraries are experiencing actual cuts in budgets, or, at least, level pegging of their
acquisitions budgets: and without exception purchase grants are not keeping pace with the market price of books and manuscripts.

The second major plank of microform development is preservation microfilming. A recent article has pointed out that preservation, and its by-product of preservation microfilming, has now come of age. There is general acceptance of the importance of preserving the books and manuscripts that form our collections, and form part of the national heritage. In the United States the Research Libraries Group's Co-operative Preservation Microfilming Project has been active for some years and, in 1986 the Committee on Preservation and Access was established to foster and support collaboration among libraries, and other appropriate organizations. Its aim is to encourage the preservation of the published and documentary record in all formats and to provide enhanced access to scholarly information. The plan is to film three million deteriorating volumes over a twenty-year programme. In the UK, the Newsplan Project set up by the British Library in the early 1980s has made excellent progress although hampered by shortage of funds and staffing pressures: in my view it represents the best kind of initiative from a national library to protect a particularly fragile part of the national heritage. More recently, in 1988, the Mellon Microfilming Project has been another very welcome development, made possible by the generosity of the Andrew W Mellon Foundation. And here I must comment on the difference in North America and in the UK in terms of the financial support available in both countries. One cannot read about preservation activities in North America without being struck at once by the evidence of the vigorous financial support that is available to libraries, through federal or special funding, in setting their preservation goals. It is sobering to reflect that the Mellon Microfilming Project is possible only because funds have been provided from the United States by the Mellon Foundation. Magnanimously, they take the view that our culture is also theirs because of a common European heritage, but it would be heartening to see evidence of similar support and sympathy for the preservation of our national heritage from our own Government.

Nowadays microform in libraries is generally defined as microfilm and microfiche. Together they account for an expanding proportion of a library's collection. To take the example of the British Library Document Supply Centre, which has utilized microform on a large scale, their statistics indicate that they hold over 3 million reports on microform; over 1700 miles of microfilm; and over 300,000 items, other than reports, on microfiche. To return to the question posed by the title of the paper: microforms: are they working for libraries? Before that question can be answered, we must first ask ourselves what we think microforms are supposed to do for libraries. Why do we have them? And whose interests do we think we are advancing when we acquire them: are they to benefit those of us who are custodians of collections, or are they intended to be a resource for library users or patrons? I would how many of us have considered these questions in any depth?

So why do we decide to add microform to our collection? It seems to me that there are four main reasons why libraries acquire microform.

Firstly, we select them as a means of collection building. Commercially produced microform research collections can aid the development of collections by plugging retrospective gaps. Major series, such as The Nineteenth Century produced by Chadwyck-Healey, which provides a vast range of the 19th-century printed books, fulfils two functions: that of collection building and also that of preservation. Apart from major series, microform is also a convenient means of supplying single gaps in retrospective collections; a copy of a rare edition may be difficult to come by, but a microform copy supplied from another library can provide the text, if not the form of the original publication.
Secondly, we acquire microform for preservation purposes in order to protect the original publications by creating an intermediary copy. This is usually where the original is fragile, or rare, or where it is, or is likely to become, subject to heavy use. The introduction into the 1988 Copyright Act of the concession to make a copy of items within the period of copyright for preservation purposes has been extremely helpful. Since as a national library we will normally have only one copy of a modern book, we find it very useful to be able to make a microfilm of any book that is heavily used by our readers where we consider that the amount of use is adversely affecting the condition of the original. However, there are situations in which microform has its limitations in solving the problems caused by heavy and sustained consultation. We have been finding that undergraduate and postgraduate students of Fine Art, who use our library, have been consulting the same texts heavily with the consequent risk to the condition of the originals. In these cases, the creation of intermediary copies on microform is not entirely satisfactory because for users of these texts, the illustrative matter is often as important as the textual matter, and reproduction on film, while satisfactory for identification purposes, is unacceptable for detailed study purposes.

Thirdly, microforms can be created or acquired for security purposes. For example, in many libraries, including our own, we insist that a microfilm copy is made, at the borrower's expense, of any printed book not already microfilmed before that book is lent to another institution for exhibition purposes. Similarly, a microform copy can be a satisfactory means of ensuring the security of the original, in circumstances where the library user cannot clearly demonstrate a need to see the original.

And, fourthly, microform technology provides a convenient means of providing copies of texts to users. A microfilm can be created where it would not be acceptable to attempt to photocopy an older book, for example, or a document that is extremely fragile: and if the user feels that he must have a paper copy, one can, of course, be created from the film.

Now to come to the crux of the matter. Our libraries are filling up with more and more microforms: large microform research collections of printed books; newspaper microfilms; single text microfilms; serials; grey literature on microfiche; manuscripts and archives; microfilms generated in in-house library programmes; and now, too, microfilms generated by the Mellon Microfilming Project. But are they working for libraries? I would like to examine this question from two perspectives: firstly, that of the library user: the scholar; the historian; the student; the local studies researcher - the people who want access to the information; and, secondly, from the perspective of the library professionals: the selector; the cataloguing staff responsible for library catalogues; the collection management staff; and the public services staff.

In my experience the majority of scholars and researchers are in favour of microforms in principle where the acquisition of microforms represents an extension to the Library's collection; in general, their reservations are a combination of (1) the principle of accepting microform as a substitute for the original, and (2) some of the practical aspects of using microform. Scholars find microform research collections useful because they enable them to stay at home and undertake at least part of their research work from there.

They can combine their preliminary scholarly researches - at least up to the point of requiring to see the original - while carrying out their daily teaching and administrative responsibilities. In the UK this advantage has become more prominent in the 1980s as teaching loads have increased and travel grants have decreased. I remember in Scotland in the early days of microforms, Scottish academics were generally rather lukewarm about them, since it was still
possible with reasonable ease to go to consult the originals. Now the wheel has turned full circle and Scottish academics besiege libraries to acquire microform research collections, except that now we have no money with which to respond to their requests.

Scores of words have been written on the subject of 'reader resistance' to microforms. Most published surveys on this question have come from the experience of United States libraries. A recent study of user attitudes and reading habits in relation to microfiche identified the two main sources of reader resistance as: (1) the user's inability to move rapidly from one section of a book or report to another and back again, and place book markers at these strategic points; and (2) the inability to compare two or more microfiche documents simultaneously unless additional microfiche machines are situated side by side - which is usually difficult to arrange and, even if it is possible, is cumbersome. Studies have also shown that reader resistance increases according to the volume of fiche. If the whole text can be contained on one fiche there is little resistance; but if the text makes it necessary to have a number of fiche resistance increases in due proportion.

For the user to find microform an acceptable medium, it is essential to ensure that it is of good optical quality for ease of consultation. Misaligned pages and out-of-focus frames do not encourage the user to plump for microform. While all custodians of collections know that a poor quality result is often the direct consequence of an equally poor quality original document, this is not something that the user finds easy to accept unless the reasons are fully explained. Why, the user may well demand, should the microform be reproduced from a poor quality original? Sometimes, particularly in the case of rare books and manuscripts, only a single original may exist, and the microform reproduction must be created from that copy, or not at all, but perhaps in such cases we should explain more fully why the quality of the reproduction is curtailed by the only copy available. At least then the microform producer will have explained to the user exactly how and why the decision about reproduction has been made.

Another factor which continues to affect user response to microform is the equipment necessary to consult microform. Some United States surveys have indicated that many microform users are deterred simply by the prospect of having to sit down in a library to consult a microfilm or a microfiche on a reader. Other surveys indicate that an important limitation from the user's point of view is the restricted number of available readers in most libraries, believing that if this situation could be improved, that the consequent use of microform would also improve. Conversely, in another survey on the use of microfiche carried out in Northern-Illinois University, 65% of respondents said that finding microfiche was simple; 72% said that using microfiche as opposed to publications on paper was relatively easy; and 47% said that the cost of photocopies was reasonable. These results from a survey where 90% of the respondents were students, I would suggest, is an indication of the change in attitude towards non-print materials among users who are daily becoming more familiar with a wide range of electronic equipment, not only in libraries but in their private lives. While it is true that the conventional library user of traditional library card catalogues may well have approached microform with some trepidation in the early days of its introduction, I would suggest that now that the modern library has become technology-oriented, and users are familiar with online catalogues, CD-ROMs and online databases, this resistance to the technology as such must certainly have dissipated. While older users of libraries may continue to show a resistance which is lodged in their own past experience, it seems to me that the continuing resistance is not now to the technology per se, but to the practical complexities of retrieving the information from microforms, especially now that the newer technologies offer faster and more comprehensive search facilities.
Of all the issues that concern the user, the most intransigent surely is convenient bibliographic access. It is a concern that is shared with library professionals. I would concede immediately that there has been a considerable improvement from the early days of microform, and I would be the first to acknowledge that firms like Chadwyck-Healey have taken enormous pains to listen to the views of scholars and librarians and that, as a consequence, they are well at the forefront of change. But, nevertheless, libraries are full of microform collections where the finding aids, or guides, that are provided by the micropublishers are of variable quality, both in arrangement and in format. We are all familiar with reel guides; separate published guides; indexes on the first microfiche; and documentation that follows some months after the publication of the set itself. Chadwyck-Healey has been at the forefront in this country in providing machine-readable records, both in UK and in US MARC format, for its Nineteenth Century collection; and nowadays records for many large microsets are available through OCLC and RLIN as a result of United States libraries co-operating to provide machine-readable records for sets in their collections. There is no comparable co-operative exercise in the UK.

In my view we have been much slower to accept microforms in libraries; much slower to co-operate with micropublishers to promote our collections through the medium of micropublishing; and much slower to get to grips with the challenge of how to provide detailed catalogue information at the item level on the contents of microform research collections, a problem that was recognized by most librarians right at the inception of their first publication in the early 1960s. OCLC’s work in developing a large and detailed database of titles for selected microform research collections is worthy of special mention. More than 85 collections comprising over 300,000 titles are now available on OCLC; and a particular refinement of the OCLC approach, which is not yet matched by RLIN, is that microform records can be tailored to individual libraries’ requirements to local information.

The brings us to the more challenging question: are microforms working for librarians? At the risk of a cliché, I suppose the answer is ‘yes’ and ‘no’. On the positive front of collection development, microforms have enabled us to add a vast array of materials, printed and manuscript, to our collections at a relatively low cost per single title, in the case of printed books far lower than the cost of acquiring the original, if indeed the original is available to be purchased. On the preservation side, too, microforms have offered libraries a solution to the problems of preserving the intellectual content of large areas of our collections that began to be recognized from the 1970s onwards: namely, poor quality paper, often compounded by heavy use, and inadequate storage conditions. Major collaborative microfilming programmes such as the Mellon Microfilming Project, are creating large numbers of microfilms of archival quality and are providing records for a Register of Preservation Microforms, in order to avoid needless duplication of effort.

But despite of all of this most of us would still agree that microforms still present difficulties for librarians. They remain one of libraries’ most under-exploited resources; there are many practical impediments to encouraging their full and proper use by library patrons; and library staff often greet them with a distinct lack of enthusiasm. Why is this still so? What are the main problems with microforms in libraries?

Firstly, to the librarian price remains an important factor, particularly under the recent pressures of library funding. Acquiring a major microform set represents a very large financial outlay for any library. While many micropublishers are very flexible and accommodating about spread purchases over a number of years, the outlay of a figure running into four or five figures for one microform research collection has become much more
difficult in the 1980s and 1990s. Collaborative arrangements can help, of course: in Scotland, for example, we operate a co-operative purchasing file for expensive purchases among the country's 15 major research libraries. I can well remember when we began to operate it in the late years of the 1970s how a report of a purchase by one library often spurred everyone else to feel they should buy it, too. A decade later, after cuts in library budgets had had their effects, the report of the purchase of an expensive item by one library was met with sighs of relief by other libraries. In the 1970s and early 1980s, one might expect that three or four research libraries in Scotland would acquire the most important microform sets: generally now one set is acquired for the country as a whole.

Newspaper microfilms are another area in which price can be a difficulty. We would all agree that newspapers should be microfilmed to archival standards, but accepting that this involves a time-consuming labour-intensive process with an expensive, but enduring, product at the end of it is less easy for libraries to accept against the pressures of finite budgets and a proper immediate desire to preserve their own collections. When the British Library, under pressure too, raised the prices of its newspaper microfilms to reflect real costs, there was an outcry. It was felt that it was inconsistent to encourage libraries to acquire archival standard preservation microfilm and then to raise prices which acted as a disincentive. All credit to the British Library for listening to its customers on this matter, and for revising the costs downwards in the interests of preservation microfilming. But, equally, we have to work hard to get the point across to those of us who work in libraries that archival quality microfilm is a sound long-term investment, while cheap microfilm is not.

Quality aspects of microform continue to be a problem, particularly with microforms acquired in the early days of the technology, which every library possesses. Intellectual defects such as lacunae in the text, or physical defects such as out-of-focus text, are more difficult with microform than with printed publications since they can take years to come to light. Most libraries now do not have the staff resources to check microform sets upon receipt. In our Library we have developed a policy, based on empiricism: for some micropublishers, we don't check at all; for others, we carry out spot checks; and for some we check everything. Micropublishers still have responsibilities further to improve quality control; and also to confirm in the advance documentation whether the quality of the reproduction is poor or uneven, if the set is reproduced from the only, or the best, copy available. This would be appreciated by librarians who could then pass that information on to their users, and preempt the complaints that inevitably follow when the researcher encounters these defects. In-house preservation microfilming programmes must also give a high priority to Quality Control at all stages.

Bibliographic control of microforms continues to be a problem, exacerbated by the funding pressures under which we all now work. As I have mentioned earlier, work on providing records for microform sets has made some good progress through the efforts of some micropublishers and bibliographic utilities, but I wonder how many libraries are also to take advantage of the availability of these records. They represent a not inconsiderable additional expense to the Library, but the main difficulty is in loading and maintaining them in an online catalogue, and combining them appropriately with existing records for the books themselves. Nevertheless as librarians, our responsibilities to our users are not only to acquire microforms but also to provide direct access to them. We need to remember that the expectations of our users have been heightened by the spread of online catalogues, and CD-ROMs. Readers now seek the simplicity of the online catalogue approach: they do not want to spend hours trying to unravel the information they seek through a maze of microfiche indexes or printed guides, all differently compiled. The reader doesn't know, and can't be expected to care, how
complicated the processing of this information is from the library's point of view; but the longer we fail to make bibliographic records available the more, it could be argued, we are impeding the researcher. This is truer than ever today: academics, for example, simply do not have the time to spend searching for information.

Then the status of microforms is another question. How many libraries have given microforms an equal status with other specialized materials? How many major libraries have a Microforms Reading Room in the same way as they have a Rare Books reading room, or a Manuscripts Reading Room. How many of us have staff who are specially trained to offer the same level of service for microforms that we accept we should offer for rare books, or manuscripts, or maps. And even if we want to do all these things, how are we to afford to do them?

It seems to me that the scholar's response to microform research collections can be summed up thus: I'm delighted you have these materials, but if you have the book I'll just consult that: I find it so difficult to investigate your microforms: it is time-consuming to work my way through these indexes, and your staff sometimes don't seem to know how to do it either. And Public Services staff's view appears something like this: Yes, we know that all these materials are being acquired by the selecting staff, and we agree with this, but they are not in the Online Catalogue, and the finding lists are all different - and in any case not many readers ask for them, so perhaps there isn't much interest in them.

The aim of this conference is to consider microforms in UK libraries. Perhaps some of the issues we need to consider during the course of the conference, and come to a view upon are:

First, what further can we do in UK libraries to improve bibliographic access to microforms? How can we encourage other micropublishers to follow the Chadwyck-Healey lead? How can libraries collaborate together to provide records that can be entered in online catalogues and assist researchers to identify the information they seek?

Second, what can we do to improve the quality of information to our library users about the microform collections we hold? How can we promote better these hidden resources? How can we explain in a credible way to readers that it makes sense to consult the microform rather than the original? And that, in asking them to do so, librarians are not simply being awkward.

Third, how can we improve the documentation available to our readers? Not just about what is available in our own libraries, but also about what is available in libraries throughout the region. In Scotland, for example, we have had for some years a union guide to microform research collections in Scottish research libraries, and from the evidence researchers seem to find it a useful aid.

Fourth, how can we encourage micropublishers to improve some aspects of their documentation - and to be more honest in their descriptions of the quality of the originals upon which their reproductions are based?

Fifth, how do we get across more effectively the message about the importance of maintaining archival standards.
Importantly, how can we encourage micropublishers to make their major research collections more hospitable to searching by users. If the text of microform research collections could be digitized, how much more convenient researchers would find them to be.

And how do we best continue to keep in touch with new technology and the benefits that it will convey? How are we to record successfully the increasing amount of colour in our daily newspapers? Will microform continue to be the most appropriate medium for preservation microfilming?

It seems to me that these are some of the issues that we should try to explore during the conference sessions. If we can identify some pointers forward that will assist researchers to make better use of the under-exploited resources of microforms in our libraries, and will assist those of us in libraries to improve the quality of our services to our users and better protect the collections, the conference will more than adequately have fulfilled its aim.
THE MELLON MICROFILMING PROJECT

Marie Jackson

It is almost exactly four years since three large dollar cheques were issued from the Andrew W Mellon Foundation in New York to the British Library, the Bodleian Library and Cambridge University Library. To those of you not familiar with the Mellon Microfilming Project, a little background:

The British Library was given $1.5 million to give preservation microfilming grants to UK libraries and to administer a planned, national programme of filming under the auspices of the National Preservation Office. The Bodleian Library and Cambridge University Library were each given $0.5 million (with the possibility of further funds on a matching basis) to film from their own collections in the spirit of and along guidelines set for the national project.

At the time of the grants, it is fair to say that preservation microfilming was an accepted preservation and security medium mainly in the UK's larger libraries. The British Library was spending some £700,000 per year on filming and was, in volume terms, the leader of the pack by a long way. But all the copyright libraries were filming to varying degrees and other large libraries and archives had some facility to film themselves or a good tradition of sending material out for filming.

But was everyone filming to agreed standards? No. Was everyone who was filming checking that no duplication of filming was taking place? No. Were librarians generally convinced of the usefulness of microform? Probably not. Was there any sense of a national policy on microfilming? Beyond the already well established Newsplan programme, no.

Four years on, where is the Mellon Microfilming Project?

In the Bodleian and Cambridge University Library (with their own funding) and at the National Libraries of Wales and Scotland and Trinity College Dublin (with 50% grants from the British Library) filming under the project is now underway to agreed standards. Records of material filmed are being input onto the Register of Preservation Microforms, now available online via BLAISE. A project manual has been produced, essentially as a step by step guide to the entire preservation microfilming process for those libraries being given grants under the scheme but in reality the only UK produced guidelines on good filming practice. A central store facility for master film produced under the project is established. A variety of leaflets have been produced on the project specifically and good practice generally. Good links have been forged with Newsplan. Communication is good with American colleagues long used to administering large microfilming projects. This national conference is being staged on the subject of microform use in libraries.

Perhaps most important of all, the first two phase two grants (ie outside the copyright libraries) have been awarded. More grants will almost certainly be awarded this Autumn.

I would like to spend the majority of my time looking at the real successes which the Project can chalk up and, of course, the elements which, frankly, we got wrong. As Head of the National Preservation Office from the time of the grants (almost to the day) until the time of the first grant awards of phase two (almost to the day) I'm in a good position to stand back and speak true. But, first a brief run down of the order of events in the project so far:
A Steering Committee was formed of the copyright librarians or their representatives. This Committee met to work out how the Project should be organised. By June 1989 three meetings had been held and a Statement of Intent for the project had been drafted. The key elements contained in the Statement were

*funds would be used to film important scholarly collections held in the UK

*filming would be to agreed high standards

*the Register of Preservation Microforms - the British Library's database of master negative film - would be enhanced to take its place as the key tool of the project

*material to be filmed would be chosen on preservation criteria not commercial ones (ie money from the fund would not be used to film material worth the attention of a microform publisher)

*given Newsplan, newspapers would be excluded from the project. No other items would be specifically excluded, but printed books and serials would form the majority of the filming. Archive material which was specifically relevant only to its own holding institution (for example, company records) would not be considered.

*the filming process would produce a master negative for storage, a duplicate negative for the originating library together with a positive for the originating library's users

*that material would be filmed subject to the conditions of the Copyright, Designs and Patents Act 1988

As the Steering Committee were drafting their Statement of Intent, work was already underway to enhance the Register of Preservation Microforms. The Register had been in existence since 1986 and at the time of the grants had some 30,000 records of material filmed by the British Library. Part of the British Library grant was specifically earmarked for upgrading the Register, making it an online file and accelerating the rate of record input. Two new staff were appointed under the Project to ensure speedy input of the BL filmed material not yet on the Register. The Manager of the Register, became a key player in the Project, and was later made Mellon Microfilming Project Officer (part time).

Another element of the Project was in progress. The British Library's Research and Development Department had been allocated a reasonably small sum (some £75,000) from the British Library Mellon Grant to do some associated research. The Department matched the money from their own resources and began work on three projects. The general theme was 'What is next, after microfilm?' and the largest funded project is that being undertaken by Cimtech Ltd.

The collections of the copyright libraries were obviously key in the filming of important scholarly material and it was an early and natural decision to set up programmes of filming in the national libraries of Wales and Scotland and Trinity College Dublin to complement those already taking place in Oxford and Cambridge. There was support, moreover, for a first phase whereby the coordination of the project as a whole could be tried and tested through work in the five libraries.
At this stage an important development took place. In late 1989 when those of us involved in the Project within the copyright libraries were beginning to get to know each other, the Mellon Foundation, in the person of the then grants administrator, Jim Morris, suggested that those involved in the Project 'on the ground level' have 'some form of meeting'. We identified 13 key people - two from each of the five filming copyright libraries plus the Head of the National Preservation Office, the Mellon Project Officer and the Head of Microfilming at the British Library - and made further enquiries of the Foundation on what might be appropriate. I was thinking of a couple of days in London. Jim Morris, to our astonishment, had already put aside money to fund the 13 of us to spend a week in the United States.

I cannot stress strongly enough the importance of the trip to the US which took place in May 1990. By the time we returned, after visiting key institutions like New York Public Library, the Library of Congress, MAPS (Micrographics Preservation Service) and Columbia University, a true Working Group for the Project had been forged and enthused.

As the copyright libraries filming continued and the Register grew, the next big step was the first attempt to give grants to other institutions. A leaflet and further publicity detailing how to apply for grants was issued in September 1991. The leaflet explained the concept which had always been an accepted part of the Steering Committee's thinking - grants would be given on a 50/50 monetary basis to ensure maximum commitment to the Project.

This is where we lost serious time. It took a while for it to become clear that, since planning the project in late 1988 and early 1989, the world had turned around and the scant resources which had been available in some libraries for such work had disappeared. Moreover, those librarians I spoke to in late 1991 and early 1992 were usefully honest in telling me just where their priorities did lie and top of the list was not national preservation cooperation. Instead, staffing, retrospective cataloguing, equipment were key. In early 1992, the criteria for the Project were re-drafted. Grants of up to 100% of filming costs are now being made available. Better to film less of the right material than hold out for matching funds and support only those institutions able to contribute financially.

The early insistence on 50/50 funding was clearly, but only in retrospect, a mistake. I believe it was our main one. The other aspect of the Project which none of us foresaw was the time we would need to get this far. To an extent we were too optimistic at the outset that the stage involving the setting up of filming programmes in the copyright libraries would take very little time. What we found when the Working Group formed and rolled up their sleeves was an outbreak of honesty regarding standards and working practices. Not all of us were reaching the high standards we wanted to instill in others. Changes take some time, but this is time well worth taking.

What have we got right? I believe, most of it. The Working Group participation in the running of the Project was inspired. We have gained personal and institutional professionalism and expertise which I believe has made the Project a world leader and I must here pay particular credit to one man, Terry Ilbury. Terry has been involved in the British Library’s microfilming operations for forty years and is universally recognised, except by himself, as the UK’s technical expert. His input to the Project and to the Working Group, has been instrumental in getting us this far.

Thirteen people geographically spaced around the UK, with a hard working Project Officer aligned to a National Office which had already established itself in the preservation network, all did more for communication than one can easily assess. And communication is a key part
of this project. We were never looking simply for more film on more shelves. We wanted more librarians to embrace the possibilities. We wanted more literature on the subject. We wanted better equipment. We wanted higher standards.

This gathering is, to my mind, a notable success for the Project and the breadth of vision which we have tried to make its hallmark. Had we not made communication and cooperation our key tools we would not have the good, firm and valuable relationship we now have with, for example, the Newsplan project, the Research Libraries Group (RLG), commercial filmers and suppliers. Our sponsors for this conference, Kodak Office Imaging, have supported us not simply because the Project will use nice quantities of film but because we are taking a wide view of all the issues at stake and are convinced of the need for quality, planning and cooperation.

The Register is a key success. It now lists 81,011 entries of master film and is available for checking online. Its records also appear on RLIN (RLG’s Research Libraries Information Network) and it is playing its part in the European Register of Microform Masters (ERMOM) and International Register of Microform Masters (IRMOM) initiatives. A fiche version of the Register is planned for later in 1993.

The master film from the Project (already some 2,213 reels) is now being kept in a properly controlled central store. Discussions are underway about widening this into a national facility for the UK’s master film.

The Steering Committee meets later this month and will almost certainly award more grants. This is probably a good place to end. I was present at the first meeting of that Committee. They spoke in late 1988 of how to begin a unique project. They meet this month with an agenda which includes the future of a national central store for microform masters. Those institutions to whom they decide to give grants will become part of a project with a sound infrastructure and high technical standards and working practices which has probably travelled less far than hoped, but which has set a good course for the future.
NEWSPLAN, THE PRESERVATION MICROFILMING OF NEWSPAPERS AND BEYOND

Geoffrey Hamilton

Preservation microfilming in Britain today is dominated by two major cooperative microfilming programmes. The Mellon Microfilming Project is one, the other is NEWSPLAN. Although NEWSPLAN's history is still comparatively short and can be traced back only some 10 years, nonetheless NEWSPLAN was on the scene before the Mellon Microfilming Project got underway. NEWSPLAN is a cooperative approach to securing the preservation, on microfilm of archival quality, of local newspapers published anywhere in Great Britain or Ireland. The nature of this material, typically intended for circulation within quite narrowly circumscribed geographical boundaries, naturally suggests a regional approach to its preservation. NEWSPLAN was therefore conceived as a cooperative programme based on the existing regional library cooperative organisation.

Cooperation implies partnership. The partners in NEWSPLAN include public library authorities, newspaper offices, record offices, academic libraries and the British Library Newspaper Library. The Newspaper Library supplies leadership, guidance and some continuing financial support, though NEWSPLAN has so far been funded mainly by public library authorities.

The Newspaper Library at Colindale has the most complete and wide ranging collection of British newspapers from all periods, mainly built up through legal deposit. There is also a widely dispersed resource of provincial newspapers. From the beginnings of the public library system in the 19th century local newspapers were assiduously gathered and usually, within the limits of resources, carefully tended in reference or local history departments. Newspaper offices usually retain files of their own publications, primarily as a resource for today's journalists, though many newspaper publishers operate generous public access policies. Some academic libraries have acquired newspapers perhaps somewhat incidentally, and some of the earliest and unique surviving examples of provincial newspapers are in academic libraries.

NEWSPLAN's beginnings can be traced back some 10 years. It was in the South West region of England that in the early 1980s, following discussion of the problems of bringing deteriorating files of newspapers under control, the idea sprang for a project to report on surviving files of the region's newspapers. The project would seek to answer several questions. Where were these newspapers held? What was their condition? What microfilming had already been done and what further microfilming was intended? The British Library agreed to fund a pilot project which was undertaken under the direction of John Beard, then the County Librarian of Hampshire, by Rosemary Wells. The results of her investigation were published by the British Library and established the pattern for subsequent NEWSPLAN project reports. The report describes the state of the region's main newspaper collections and gives detailed information on files of individual newspapers, coupled with recommendations for future microfilming and conservation activity expressed in terms of priorities. Such was the success of the pilot project that within a remarkably short time NEWSPLAN proposals were being prepared in all other cooperative library regions in Britain and Ireland. By late 1992 seven NEWSPLAN reports had been published. In the three remaining regions a report was either being prepared for publication or work was in progress.
The NEWSPLAN process depends on local initiatives, largely funded by public library authorities. Progress towards implementing recommendations made in each NEWSPLAN report is monitored by a regional Implementation Committee. At the national level a NEWSPLAN Panel has been established within the framework of LINC. This representative body receives regular progress reports from the British Library and from the regions and also serves as a national forum in which wider issues relating to newspapers in libraries and as research material can be discussed. NEWSPLAN has indeed become a network.

The Newspaper Library is actively involved as a member of all regional committees, provides secretariat services for the LINC NEWSPLAN Panel and through its microfilm unit undertakes much of the filming that NEWSPLAN entails. It would be neither possible nor desirable for the Newspaper Library to have a monopoly of NEWSPLAN microfilming. There are opportunities for commercial bureaux and other in-house microfilming facilities, so long as they are able to meet the requirements of preservation microfilming, in terms of adherence to recognised standards and specified practices.

Some may question whether it is necessary to make so much fuss about newspapers. Are they worth it? Why do they need special treatment? Newspapers do present libraries with major problems. They are designed to have an extremely short life, shorter than almost any other printed material. Newsprint is a particularly low grade of paper with chemical impurities and physical weaknesses that will inevitably result in eventual disintegration, if no preventative or restorative treatment is provided. Newspapers are physically very awkward material for libraries to handle. Their size, their quantity, their physical characteristics all combine to pose problems of storage, delivery and use.

Those are negative points, but there is also a very strong positive side to newspapers. They are unique in the range of information they contain. They touch upon events and upon the lives of individuals at so many levels and in so many different ways that none of us is likely to escape entirely from their attentions during our lives. Researchers in many disciplines and at widely differing levels of research increasingly recognise newspapers as an important resource. The Newspaper Library is receiving heavier use now than at any time in its history and many other libraries are similarly experiencing a very heavy demand for newspapers. To bring this huge information resource under control and harness it to a really efficient and affordable information retrievable system is a challenge that must await a satisfactory technical solution. Some current developments, for example the application of CD-ROM technology to newspapers and experiments with digitisation, may be pointers to the nature of this solution. But progress on these lines will not be possible unless we have first successfully preserved the content of newspapers for future users.

What has NEWSPLAN achieved? Research in each region has discovered where surviving files of newspapers are and what condition they are in. Preservation action already carried out has been recorded and its effectiveness has been assessed. Unfortunately, not all newspaper microfilming projects have produced an end result which can be hailed as the solution to that paper's preservation needs, and some refilming will be inescapable. The NEWSPLAN reports have also assessed priorities for future filming.

As filming is carried out, so it is building up a new resource of microfilmed newspapers. What begins with a concern for preservation comes to a point at which, with that goal achieved, it becomes possible to consider ways of making newspapers more widely accessible by taking advantage of the relatively low cost of producing further service copies from an existing negative. It need no longer be the case that the would-be user of a newspaper must
travel to Colindale to consult files of local newspapers. It may only be necessary to make a much shorter journey to a local library, where one of a number of copies of microfilm can be consulted. Even interlending of microfilm copies may be a realistic proposition. The NEWSPLAN master negative, properly stored and recorded in the national Register of Preservation Microforms, is a guarantee of the paper’s continued availability and of the possibility of further duplication.

It can never be as easy to gain access to back files of newspapers as it is to acquire a current issue from any of a large number of conveniently located distribution outlets. But it ought not to be more difficult to consult back files of newspapers than to consult other material of similar age which, when first issued, was probably considerably more difficult to acquire than newspapers.

The benefits of NEWSPLAN accrue steadily and cumulatively. It is a gradualist approach and builds up its value and its importance through a number of individually modest, and modestly priced, achievements. When the British Library’s filming charge of £120 (1992 price) for a 100 foot reel is related to weekly newspapers, it works out at £40 per year to preserve a 4 page newspaper, £60 per year for a 6 page newspaper and it is only when the average pagination reaches 16 per issue that the cost of a second reel is incurred. This seems a small price to pay for the preservation of an important part of our national, and local, heritage. The locally borne charges can be even less than this, because the British Library itself meets 25 per cent of the cost of most NEWSPLAN filming orders, and if two or more institutions agree to share filming costs.

It is particularly welcome that this conference about microforms in libraries should provide an opportunity for discussing NEWSPLAN alongside other microfilming activities. In the past two years, NEWSPLAN and the Mellon project have discovered how much they have in common, and how many of the topics which are of concern to one are also currently interesting the other. We now have, through the representation of the Mellon Microfilming Project on the national LINC NEWSPLAN Panel, a means of ensuring that these shared interests can be effectively pursued and taken forward. The leaflet recently issued by the Mellon Microfilming Project on Choosing a 35mm Microfilm Reading Machine incorporates comments from NEWSPLAN committees and is presented as a joint publication of the two projects.

Mellon’s emphasis on standards for preservation microfilming projects mirrors a concern which has always been present in NEWSPLAN. The recently issued Mellon Microfilming Project Manual, containing information and advice to be used in connection with projects funded by Mellon, is something which NEWSPLAN will wish to consider, perhaps as a basis for a companion volume. It is a condition of Mellon projects that master negatives produced will be recorded in the Register of Preservation Microforms. There are potential advantages for NEWSPLAN in ensuring that NEWSPLAN microfilming meets the qualifying standards for registration, and perhaps some benefit for RPM in extending its coverage by the addition of entries for newspapers.

The Mellon Microfilming Project’s basic aims are to promote high national standards; to select and commit to film material of national and scholarly importance; and, to make such film widely available through the creation and exchange of machine readable records. NEWSPLAN’s aims are similar, but not identical: to record the condition of hard copy and microfilm of surviving files of local newspapers; to secure preservation of local newspapers on archival quality microfilm; and, to make such film widely available. Mellon is a major
source of funds. The British Library Newspaper Library's funding role in relation to NEWSPLAN is considerably more limited. The Mellon project has so far considered that it should support newspaper filming projects only in respect of material which is outside NEWSPLAN scope. This means national papers rather than local papers and perhaps foreign papers. Arguably foreign papers should be covered by projects established and supported by their own countries. That issue may well be taken up through the IFLA Round Table on Newspapers, in which the Newspaper Library is an active participant and in the Medium Term Programme of which there are currently a number of projects concerned with microfilming of newspapers.

There is a further difference, in that Mellon projects are fund driven from the centre. NEWSPLAN projects are locally initiated and so far depend very largely on purely local sources of funding, in most cases the budgets of individual library authorities. LINC has recommended that public library authorities should allocate one per cent of their materials budgets (book funds) to NEWSPLAN projects. Many authorities have accepted this, at least as a planning target. It may be that for some of the projects which have not yet reached the implementation stage, particularly those in Scotland, Ireland and Wales, a somewhat different pattern of funding will be appropriate.

In its first 10 years, NEWSPLAN has already achieved a great deal. What may the future bring?

If NEWSPLAN master negatives are reported to the Register of Preservation Microforms, there will be implications in respect of the standards of work which NEWSPLAN customers require from bureaux and filming agencies. Where there is a microfilm negative, the possibility exists of making a connection between preservation and access. This raises the issue of whether there should be a national newspaper database. A comprehensive record of the availability of newspapers in hard copy or on microfilm seems a likely pre-requisite for interlibrary lending of newspapers on microfilm. This has received little attention in recent years, though a recently published paper points out some of the issues, implications and possible methods by which newspapers could be brought within the scope of interlending. It also seems appropriate to point out that when current intentions for the retrospective conversion into machine readable form of the British Library Newspaper Library's catalogue have been fulfilled, there will be a suitable basis for developing other tools including a United Kingdom database of newspapers.

Further consideration should be given to ways of funding NEWSPLAN as it continues. If too much reliance has to be placed on local funding, we could get into a position in which some authorities have already completed their NEWSPLAN obligations while others in the same region still have a long way to go and perhaps have no prospects of funding at a level which would enable progress to be made with the desired speed. A more cooperative approach to funding and the creation of regional pools of funds for NEWSPLAN projects may provide an answer. We should not overlook possibilities of attracting funding from external sponsors. Corporate sponsors may be able to make substantial contributions. Individuals may respond with more modest donations to an imaginatively presented invitation to "save a newspaper", but nevertheless be able to see an end product - microfilm reels or a conserved original - with due acknowledgement to the donor.

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NEWSPLAN has shown interest in various topics that are not directly associated with preservation. The indexing of newspapers still has far to go, although an impressive number of local newspapers indexing projects is known to the Newspaper Library - well over 1,000 at the latest count. Many of these projects have a very selective approach to what is to be indexed and suffer from inconsistency in assigning indexing terms. Guidelines are needed and current work in Northern Ireland may produce some which could be adapted for wider use. Some of the ways in which access to newspapers could develop may raise questions of copyright. It may not always be clear who owns the copyright in the microfilm of a newspaper, though many such uncertainties can be eliminated at the outset by including appropriate clauses in microfilming contracts.

The choice of microfilm as the medium of preserving newspapers, though a natural and generally satisfactory solution, fails to deal with problems of the increasing editorial use of colour in newspapers. There is a school of thought which holds that black and white microfilm is an adequate way of preserving material even in colour, because the colour is decorative and used to provide emphasis. However, as its use proceeds in ever more ingenious ways, there will be many instances in which, if it is not possible for future researchers to see the original in full colour, some information will undoubtedly be lost. A good recent example appeared in the Daily Mail, which presented two group photographs, respectively of the Cabinet and of the Shadow Cabinet. They were portrayed in a rainbow range of colours allocated according to their attitudes towards the Maastricht Treaty. From the text alone it is not possible to judge exactly the views of particular individuals. You have to see the colours to understand this article. A satisfactory solution to this problem has yet to be found.

NEWSPLAN has been concerned to preserve along with other local newspapers the multitude of local variant editions. We have thereby got into a rather odd situation, in that there is a much better likelihood that posterity will be able to consult variant editions of local newspapers than to compare the changes in news and the different reporting of items in regional and timed editions of major national newspapers. We already know that no copy has survived of some of these variants. Before it is too late, we should consider undertaking a further NEWSPLAN style project to establish as fully as possible which editions of national newspapers survive and to recommend action, which in some cases may be especially urgent, to ensure their filming.

A further stage of NEWSPLAN may see the development of national policies for acquisition and retention of newspapers aimed at meeting the needs of tomorrow's users and facilitating the introduction of improvements to services which developments in new technologies may offer. This may sound like a library and information plan for newspapers. It has indeed been suggested that NEWSPLAN should become a LIP. NEWSPLAN already meets the main requirements for establishing a LIP and the matter is being kept under review. In its present form, NEWSPLAN has had considerable success based on contributions and support that it has almost universally received from the public library authorities in Britain and Ireland, from academic libraries and record offices, from the newspaper industry and from research users of newspapers. Newspapers, once branded as the problem children of libraries, are perhaps becoming more tractable adults.

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INTRODUCTION

Although rapid advances are being made in the development of electronic techniques for storing and preserving information, microfilming continues to be the primary means of preserving the intellectual content of endangered library materials.

Preservation microfilming involves a series of processes designed to create a product that meets strict quality controls. Specifically, preservation microfilming requires the creation of three generations of high quality film each of which has a particular purpose.

The first generation camera master or master negative is intended to be the primary preservation copy. It should be handled with the utmost care and after quality checks should be used only to produce a single second-generation duplicate negative before it is permanently stored in a secure controlled environment. This is the copy intended to ensure the long-term preservation of the image.

The second generation duplicate negative is often also called the printing master. It is the copy used to produce all other copies of the film, the intent being to protect the first generation copy to the greatest extent possible.

Finally, third generation copies or service copies are produced for use. The originating institution typically produces one or more service copies for in-house use and possibly for inter-library loan, depending on institutional policy.

BIBLIOGRAPHIC CONTROL

This brings us to the importance of bibliographic control. There are three fundamental purposes for providing accurate and adequate bibliographic control for preservation microform.

The first and most basic purpose is to meet requirements at the local level where the service copy must be catalogued for incorporation into the local catalogue; this permits it to be located and used and also facilitates basic library collection management functions. For this particular purpose, cataloguing level and complexity only need to be complete enough to meet local needs including resource sharing requirements related to interlending.

But preservation microfilming demands a considerably greater responsibility for bibliographic control than just local cataloguing. This involves the bibliographic identification of both the camera master and the printing master.

It appears likely that library collections are deteriorating at a pace more rapid than our ability to preserve items. This means that we are seriously at risk of losing large parts of our published heritage forever. This being the case, it is vital that we put all the resources available into the preservation activity and that we ensure that we do not duplicate what other libraries have done before us. For it stands to reason that if one library’s copy of an item has deteriorated to the point of warranting microfilming to preserve its content, copies in
other libraries may be in a similar state of decay. Before undertaking the expensive task of preservation microfilming, it is incumbent upon a library to perform a bibliographic verification in appropriate sources to determine whether the item has already been preserved elsewhere. If the item has been microfilmed, the library may not only eliminate the item as a candidate for filming but may usually purchase a new service copy from the institution which originally filmed it.

These are the second and third fundamental purposes for bibliographic control of preservation microform that I mentioned earlier. To recap, bibliographic control is required to permit a library to manage its collections, to facilitate the ordering of a service copy as a surrogate for a deteriorated item and to avoid unnecessary and costly duplication of effort in the world's effort to preserve its published heritage.

In this context, it is obviously not sufficient to catalogue only for the local catalogue. It is essential that libraries everywhere be made aware of the existence of preservation microform masters.

CATALOGUING ISSUES

One of the important issues related to the development of registers of microform masters is the conflict between cataloguing rules and the techniques most often preferred for handling preservation microform.

The first edition of the Anglo American Cataloguing Rules\(^1\), for example, included a provision for cataloguing reproductions when it was desired to catalogue them as copies. The technique was based on the premise that libraries could pull cards from the card catalogue and simply annotate the variations at the bottom of the card. This was known as the "dash-on technique" and it was used for a number of things including microreproductions and added copies, especially when there were variations in the copies. Generally speaking, however, AACR1 specified that reproductions were to be described primarily in terms of the original. The "dash-on technique" was prescribed for use ONLY when it was desired to treat microreproductions as copies.

When AACR2\(^2\) was published, a significant change was included for microreproductions. The authors of AACR2 felt that all materials should be treated in the same way. This in fact is the "cardinal principle" of AACR2 which states that the description for every item should be based in the first instance on that item rather than on any related item. This had a far-reaching importance for microforms, because it in fact meant that microforms had to be described as microforms, not as copies of the originals from which the microform was copied. This was a change from previous practice. Ever since that time there has been a continuing debate about the merits of the AACR2 approach to cataloguing microforms.

In fact, the Library of Congress and consequently most, if not all U.S., many Canadian libraries and the British Library chose not to follow AACR2. The National Library of Canada, however, chose to stick with the new principles as did the National Library of

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It is important to understand that both approaches specify that separate records must be created for the microreproduction. The difference is that the approach followed by the Library of Congress describes the reproduction as a manifestation of the original while the AACR2 approach describes the reproduction as an entity in its own right.

Figure 1 demonstrates AACR2 cataloguing which recognizes that the reproduction is a publication in its own right and that it was published in 1990 by University Microfilms, not in 1907 by C Scribner's Sons.

Cataloguing according to AACR2

Hornaday, William T.

Camp-fires in the Canadian Rockies [microform] / by William T Hornaday. - Ann Arbor, Mich. :

University Microfilms, 1990.

1 microfilm reel; 35 mm


FIGURE 1

On the other hand, the other approach recognizes that reproductions have a special relationship to the original item from which they were copied and that most researchers are interested in the intellectual content of an item, not whether it is available in different formats. This is the underlying premise of the Library of Congress Rule Interpretation (see figure 2). In other words, if a researcher wishes to consult the content of the 1907 edition of Camp-fires in the Canadian Rockies by William T Hornaday, it is of secondary importance to most researchers whether the library provides the original item or a microreproduction.
Cataloguing according to the Library of Congress Rule Interpretation

Hornaday, William T.


xvii, 353 p. : ill. ; 24 cm.


FIGURE 2

The dichotomy between these two techniques has not really been resolved and records created according to the two methods have co-existed in our catalogues. A new technique is being proposed in North America which uses a two-tiered approach. Perhaps this technique will help to eliminate the divergence between the two approaches.

In the meantime, some countries are having to face the conflict head-on because the approach preferred predominantly for registers of microform masters is the one in conflict with the Anglo-American Cataloguing Rules. The registers of microform masters in the UK and in Canada have established guidelines for bibliographic control which conflict with the official cataloguing standards of the national library. Because of this, the National Library of Canada is just completing a re-examination of its cataloguing policy for microreproductions.

Before leaving the subject of cataloguing issues, it should be pointed out that the Association of Research Libraries in the United States published in 1990 an important document entitled Guidelines for bibliographic records for preservation microform masters. One of the important aspects of this document is its complete approach covering not only the structure and data content of bibliographic records but also guidelines for quality of the data, particularly name and subject headings. The ARL guidelines were seen as a significant contribution toward "the establishment of a national preservation database through the cooperative efforts of participating libraries" in the United States.


4 op. cit., p. 2.
OVERVIEW OF NATIONAL ACTIVITIES

UNITED KINGDOM

The British Library has maintained a manual file of cards with minimal bibliographic data for microform masters for the past 30 years. It was available as an internal tool only and contained approximately 80,000 records.

A Register of Preservation Microforms had been established in the British Library in 1986 as an internal file and was offered as a national database as part of the Mellon Microfilming Project. The British Library had already input 32,000 records which formed the nucleus of this file. This has now been mounted on BLAISE. It is planned that a microfiche product be produced from this file. Participants are required to submit records as a condition of participation. As of the beginning of October this year, the Register of Preservation Microforms contained over 81,000 records with contributions from not only the British Library but also Chadwyck-Healey's Nineteenth Century microform series, Cambridge University Library and the National Library of Scotland.

CANADA

In Canada, a Canadian Cooperative Preservation Project has been working over the past 2 years thanks to a generous grant from the Andrew W Mellon Foundation. We too have established a register which we call the Canadian Register of Microform Masters. It is loaded on the National Library of Canada's DOBIS database which also contains a significant number of records of preservation copies of newspapers as well as the complete file of over 66,000 records created for the microfilm produced by the Canadian Institute for Historical Microreproductions. The five research libraries participating in the Canadian Cooperative Preservation Project are required to contribute records to the Register and we are strongly encouraging other Canadian libraries and archives to report records for preservation microform masters which reproduce published material.

FRANCE

The main focus for preservation microfilming in France is at the Bibliothèque Nationale where printed catalogues of microform masters are produced each year. A cumulative catalogue for 1981-85 is also available. Since 1989 the Bibliothèque National has been creating an automated catalogue of preservation masters in the UNIMARC format.

In March 1991, negotiations were concluded on a contract with the Commission on Preservation and Access to convert the Bibliothèque Nationale's retrospective records for microform masters to machine-readable form. The two-year contract calls for the conversion

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of 130,000 records.7

AUSTRALIA

Australia is seriously considering the development of a National Register of Microform Masters. They have not yet done so, precisely because of the conflict in cataloguing standards. It is anticipated that an Australian standard for cataloguing microform masters will be accepted in 1993 and then it will be possible to produce a register using records from the National Bibliographic Database on the Australian Bibliographic Network. It is anticipated that the National Library of Australia and State Libraries throughout Australia will contribute records to the proposed register.

UNITED STATES

Probably the oldest and most intensive efforts to provide bibliographic access to preservation microforms has taken place in the United States. The Library of Congress published a National Register of Microform Masters8 from 1965 to 1983 when it began including records for master negative microforms in the National Union Catalog9 and New Serials Titles10. Nevertheless, access to the information contained in the Register involved cumbersome searching of many volumes. Many of these records are in machine-readable form and would also be accessible through the major bibliographic utilities.

In 1986 the Association of Research Libraries and the Library of Congress began a project funded by the National Endowment for the Humanities to convert the Register to machine-readable form. The current phase of the project is converting the monographic portion of the Register which comprises approximately 470,000 titles. About 110,000 of these records have not yet been converted but supplementary funding has been secured which will permit the remainder of the file to be done by June 1993. The serials in the file will be somewhat more complicated to convert because of the need to verify holdings of microform copies. There are about 60,000 serial titles. The Association of Research Libraries is now working on a plan to secure funding enabling them to do the serials over the next few years.

No discussion of bibliographic control of preservation microform can ignore the very great contribution of the Research Libraries Group. RLG was established in 1974 and one of the areas that formed the core of its activities was preservation. In the early 1980s, RLG coordinated a project which converted a total of 22,000 manual records for preservation microform and added them to the RLIN database. At the same time, records for ongoing microfilming projects were being added to RLIN; considering that RLG's first cooperative preservation project resulted in the filming of 30,000 titles, this represented a significant

10 New Serials Titles. Washington: Library of Congress, 1953-
source of information about existing preservation microfilm.\textsuperscript{11}

Late in 1990, the two major bibliographic utilities in the United States, RLIN and OCLC, agreed to exchange bibliographic records for preservation master microforms. Records are exchanged monthly and this represents an important contribution by both utilities to the prevention of duplication of preservation efforts.

RLG has also loaded records from the British Library and there are plans to load records from the Bibliothèque Nationale and those produced by the Canadian Cooperative Preservation Project. This can be seen as a step toward the eventual development of an international database of bibliographic records for preservation microform masters.\textsuperscript{12}

As of March 1992 the RLIN database held records for over 606,000 first generation master negatives and 227,000 printing masters. The RLIN database therefore clearly represents an extremely important resource for the verification of the existence of preservation microform and the avoidance of duplication of effort. RLG offers the \textit{RLIN Register of Microform Masters} as a set of 46 microfiche. The latest edition which contained about 120,000 records was released in August 1988. There are plans shortly to release a CD-ROM product of the preservation microform in the RLIN database.

Many other countries that do not have registers of microform masters as such, nevertheless have included annotations in records for the original that preservation microform exists.

"QUEUING"

One of the important innovations at RLG was the development of a mechanism for flagging records in the database to indicate that an institution intended to film a particular title. This is an important feature of many registers of microform masters because it provides additional assurance that duplication will be avoided. Titles are registered as soon as a decision is taken to film them. This helps to avoid the situation whereby a second institution decides to film an item while the first is in the process of doing so but has not yet completed the bibliographic control for the master. This technique is called \textit{queuing}. Some institutions, including those reporting to RLIN, queue records by annotating the bibliographic record for the original item; this would normally consist of adding a note stating that the item is to be microfilmed and would include a projected publication date for the microfilm. Another technique which is used in the \textit{Canadian Register of Microform Masters} involves the creation of a preliminary record for the microfilm which we have called a "Microform-in-Process" record or "MIP".\textsuperscript{13} A projected publications date is included in the record and when the microfilm is completed, the bibliographic record is updated.


EUROPEAN REGISTER OF MICROFORM MASTERS

All of these initiatives have a tendency to be localized, although there is a clear indication that international exposure for bibliographic records is important. As long ago as 1986, the Commission of European Communities[^14] began to explore library preservation. Originally, "the idea to launch a register of microform masters held by European research libraries was conceived within LIBER (Ligue des bibliothèques européennes de recherche)"[^15]. After an initial study by Alexander Wilson[^16], the CEC commissioned "a further study pilot project on the setting up of national registers of master microforms in automated form and their interlinking to form an EEC Register, which could in turn be linked to the USA and other countries"[^17]. As a result of this report, a project was established and charged with the task of setting up a database based on the UNIMARC format. The participants in the pilot project are France, Germany, Portugal and the United Kingdom. The installation of a database called OPALINE is in the process of being finalized at the Bibliothèque Nationale and the record format has been agreed upon. Each of the participants is studying its conversion programme from the national format to the UNIMARC definition approved for the Register.

Once this work is completed, the French and British registers will be combined and libraries in Germany and Portugal will begin to contribute records directly to the database. Projections[^18] at this time are that at the end of the first phase, the following records will be in the database:

- 20,000 records from the UK Register of Preservation Microforms which are to be converted from UKMARC
- 2,500 records input on-line from Portugal
- A total of 2,000 records converted from the German MAB format and input on-line from Germany
- At least 20,000 records from the Bibliothèque Nationale, converted from INTERMARC

The ultimate goal is for the libraries in all member countries to have access to the database on-line and to contribute records for all items filmed, regardless of imprint.


[^17]: "European Register of Microfilm Master (EROMM)" in International Preservation News, no. 4, August 1990.

[^18]: Projections vary considerably; the figures given here were supplied by the National Preservation Office (British Library) in October 1992.
This last point is an important one. At the Conference on Preservation in Vienna in 1986\textsuperscript{19}, it was generally agreed that "each national library should commit itself to the preservation of its own country's imprints". This concept was further endorsed at the IFLA Symposium on Managing the Preservation of Serial Literature held in Washington in 1989. Although the national imprint may well be the priority within each county, the problem of brittle books is worldwide and libraries will proceed to microfilm those most at danger, regardless of imprint. This demonstrates all the more the need for international cooperation in registers of microform masters so that we all may share in the information and avoid duplication. The EROMM project is an exemplar in this international effort. It is very significant, I think, that the Commission on Preservation and Access which is based in the United States is funding 40\% of the Phase I costs, offsetting the 60\% being provided by the European Community.\textsuperscript{20}

INTERNATIONAL REGISTER OF MICROFORM MASTERS

In 1988 the Commission on Preservation and Access in Washington, D.C. embarked on an exploratory study with the national libraries and other institutions in Great Britain, France, West Germany, East Germany, Australia and Venezuela.\textsuperscript{21} The purpose of the study were:

- to determine the extent to which preservation records exist in each country,
- to identify the difficulties of converting those records to machine-readable form and of entering them into a common database,
- to decide on the level of bibliographic detail needed to exchange records easily and
- to determine the best way to proceed in creating a shared database capacity.

The project was seen to be a key step in avoiding overlap in the filming of materials.

A major step in this project took place in May 1990 when a Meeting on the International Database of Bibliographic Records for Preserved Items took place in Zurich. Following this meeting, the National Library of Canada undertook to coordinate for the Commission on Preservation and Access the development of a set of Minimum Data Element Requirements for an International Register of Microform Masters. The data elements in this document were identified in accordance with the naming conventions and terminology used in The UNIMARC Manual\textsuperscript{22}. "The minimal level requirement has been established to ensure as far as possible that all records contributed to an international register of microform masters

\textsuperscript{19} Sponsored jointly by the International Federation of Library Associations and Institutions and the Conference of Directors of National Libraries in cooperation with Unesco.


\textsuperscript{21} Commission on Preservation and Access, Newsletter, No. 1, June 1988.

\textsuperscript{22} International Federation of Library Associations and Institutions, UNIMARC Manual. Edited by Brian P Holt with the assistance of Sally H McCallum & A B Long. [London], IFLA Universal Bibliographic Control and International MARC Programme, British Library Bibliographic Services, 1987.
will contain the data that is essential to support the needs of the register."\textsuperscript{23} The Commission on Preservation and Access indicated that the Minimum Data Element Requirements would be shared "with a wider audience, urging voluntary compliance. \ldots \textsuperscript{23} [The Commission on Preservation and Access] will continue to monitor the accessibility of bibliographic records of preserved materials and work toward our collective goal of convenient, international access to these records.\textsuperscript{24}

The Commission on Preservation and Access is in fact doing more than 'monitoring' the accessibility of bibliographic records. The Andrew W Mellon Foundation has awarded the Commission a $1 million grant to be used for the promotion of bibliographic control of microform masters on an international level. It is also to be used to facilitate cooperative preservation microfilming outside the United States. The contract with the Bibliothèque Nationale mentioned earlier is a good example of this thrust. Clearly great strides have been made in recent years toward the goal of universal access to bibliographic data describing preservation microform masters.

CONCLUSION

The title of this conference is "Microforms in Libraries - the Untapped Resource". The importance of microfilming brittle library materials appears uncontested in today's preservation community. The value of good quality microfilm is in the assurance that our published heritage will survive. It remains, however, vital that we all cooperate in this venture and that we ensure that the microform that we produce can be found. This can only be done with good bibliographic control and by reporting bibliographic records for preservation masters to national and international registers. In this way, we can each do our part in an internationally coordinated effort to preserve the world's intellectual heritage.


\textsuperscript{24} Battin, Patricia. [Letter to Thomas Delsey dated December 30, 1991].
MICROFILM AS ONE PRESERVATION OPTION - COSTINGS & CHOICES

John E McIntyre

THE PROBLEM

To those of us in the library and archive worlds preservation is a broad term encompassing all measures that may be taken to extend the life of materials in our care. Some institutions such as legal deposit libraries and record offices will have concern for the preservation of all of their collections, others may deem some parts to be expendable and have concern for only part of their holdings such as local history material. Discussion of preservation issues in this paper assume an institution has all or part of its holdings which are of permanent value.

Just as there are many reasons for deterioration and decay there are many courses of action that may be taken to counter deterioration ranging from remedial chemical and physical treatments to the control of the environment and increasing conservation awareness. A good preservation policy and strategy examines all the options and applies as many as possible having regard for the integrity of the collections and cost effectiveness of applications. One of the great problems all of us face is having to deal with what is usually a massive preservation problem with insufficient resources. While we will always have concern for preserving the "treasures" in our care we must not lose sight of the large mass of relatively less important material which is also in a self destruct mode and slowly crumbling away. This is why we must have concern for cost effectiveness and the need to spread resources as widely and effectively as possible across the collections. Microfilm plays an important part in this as a medium for preservation copying.

One of the great problems in preservation today is the growing brittle paper problem associated mainly with 19th and 20th century material. This is approaching a critical stage demanding action if we are to save our written heritage. Much of this material has no intrinsic value and a policy of image conversion to another form to retain the intellectual value is attractive because, at the present time, it offers a solution which is both cost effective and physically possible within the remaining time before the material deteriorates to a condition which is beyond recovery by any means. Microfilming on 35mm film to the relevant standards is currently the accepted and most popular way of achieving this. However, we must always ask ourselves 'are we getting it right?', 'what options do we have?', 'is there a cheaper way of achieving the same end?'

THE OPTIONS

What choice then do we have? Putting aside the physical limitations of the available workforce with the necessary skills, the options available to us to deal with material which has no intrinsic value are the following:

- do nothing
- box
- replace
- apply conservation treatment
- photocopy on permanent paper
- microfilm
- digitise
If we **do nothing** of course the item continues to deteriorate with the eventual loss of the item and its intellectual content. If we value the material, this is perhaps not an option.

**Boxing** to conservation standards provides a measure of protection from a harmful environment and physical damage but deterioration will continue. It will simply take a little longer before loss occurs.

To **replace** an item with one in a better condition, either in hard copy or on microform, is a solution and is likely to be cost effective for book material but availability of titles is limited and therefore a replacement policy provides only a partial solution.

**Conservation work** is labour intensive and, for seriously deteriorated material, therefore expensive. Because production levels are relatively low it also offers only a partial solution, the lack of progress through the collections would result in material deteriorating beyond the limits of recovery.

Mass treatments to strengthen paper are not presently available but some valuable work on this has been carried out. Developments of such systems in the future may well offer a cost effective treatment for acidic papers which have not degraded too far. At present, mass treatments for strengthening paper are not an option.

**Photocopying** on permanent paper offers a solution but provides a master which is bulkier than the original and in a form which requires further expenditure before it can be placed in a collection for use. There are few copiers on the market which offer 'safe' copying. Those that do copy from only one side of an opening making the process twice as expensive as it might be.

With care, it is a process that can be undertaken within most institutions and therefore has a value in quickly providing a master of an item which may be identified as being immediately at risk. Conversion to another form can take place later.

**Microfilming** to archival standards offers a good solution and is presently the most popular form of image conversion for preservation. It is productive enough to save the image of a large amount of material and allows efficient copying from the master in a variety of forms. If the original is to be retained for whatever reason, use of the correct equipment and expertise places the original at little risk.

There is a growing interest in **digitisation** and this in fact offers great hope for the future. Several pilot projects are under way to study the feasibility of digitising images for preservation. At present, however, the preservation community is being cautious. Before we can accept new technology as a solution we have to be satisfied that it fully meets our requirements in terms of life expectancy, safety of the item during scanning, the continuing availability of technology in order to read the disk or tape, and cost effectiveness.

The advantages and disadvantages of each can be summarised as follows.

<table>
<thead>
<tr>
<th>Action</th>
<th>Cost</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>do nothing</td>
<td>low</td>
<td>original form</td>
<td>eventual loss</td>
</tr>
<tr>
<td>box</td>
<td>low</td>
<td>original form</td>
<td>slight extended life</td>
</tr>
</tbody>
</table>

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CONSIDERATIONS

Before discussing costs it is worth saying something about other considerations that have to be made in association with the above actions. While the large volume of preservation microfilming is directed at the brittle paper problem, there are other reasons for filming such as security filming or the desire to make rare material more widely available. Microfilming also has a value as a preventive measure protecting fragile or heavily used material from physical damage. In any strategy, it is unrealistic to think that any one of the options stated will provide a single solution. Although one or two may dominate, a combination of solutions will form the basis of a good strategy.

In microfilming operations newspapers present special problems because of their usually advanced state of deterioration, handling problems with bound volumes and the specialised equipment necessary to film from bound files. Because of these difficulties the cost of filming from bound newspapers is often much greater than from serials or monographs. Bound newspapers have to be prepared for the camera, [which needs to be designed with a split level laterally moving table], with the removal of folds and creases and sometimes dry cleaning of dirty areas to reveal clearly the printed areas. Heavy discolouration of the paper, often varying, presents problems achieving required density levels and the weight and bulk of the items slows down camera work speeds to around two thirds of that of books. At present microfilming is the only way of preserving the content of our newspaper collections.

Considerable expenditure is likely to be made in any image substitution programme. It is therefore important to recognise the need to produce a product to archival standards if we do not want to repeat the process in future years. Whatever subsequent copying needs to be done should be an economical process and from a master with sufficient resolution to provide several generations before serious loss of quality occurs.

If we are concerned with the economics we should coordinate activities nationally and internationally to avoid duplication of effort and ensure copies are available across the world of learning and research. All these things, while increasing costs at the initial stage, ensure a more efficient application of resources in the long term.

COSTS

Costs in preservation and conservation work can, and often do, vary enormously for very good reasons. For the purpose of cost comparison I have taken what I consider to be typical
300 page 10" x 7" volume of brittle paper and deteriorated newspaper files from the turn of the century.

The following are cost comparisons between saving the original by traditional methods of conservation treatment, photocopying, and microfilming.

Prices are for production processes only and do not take account of the cost of searching for best copy for filming, record generation, etc.

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>BOOK</th>
<th>NEWSPAPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Replacement by</td>
<td>£ 20.00</td>
<td>£ 42.00 (reel)</td>
</tr>
<tr>
<td>commercial microform</td>
<td>£ 50.00</td>
<td>(reel)</td>
</tr>
<tr>
<td>b) Replacement by</td>
<td>£ 30.00</td>
<td>£120.00 (reel)</td>
</tr>
<tr>
<td>in-house microfilm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Replacement by</td>
<td>£ 57.00</td>
<td>not applic.</td>
</tr>
<tr>
<td>photocopying + binding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Conservation treatment</td>
<td>£ 70.00</td>
<td>£330.00 (boxed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>£380.00 (bound)</td>
</tr>
</tbody>
</table>

a) price based on a commercial price list and British Library Colindale cost for purchase of duplicate.

b) price based on NLS & British Library Colindale costs

c) price based on NLS copying with commercial binding cost

d) price based on NLS in-house conservation costs.

Microfilmed newspapers are priced per reel.

STANDARDS

Whatever action is taken within a preservation programme it is essential that work is carried out to the highest standards. With preservation microfilming we are spending large sums of money on what is probably the only chance to capture the image in a form which provides considerable life expectancy. This means we must work with equipment designed to the highest specifications and strive to exceed the minimum specifications set in the British and ISO standards. Anything less is not acceptable.

Preservation microfilming is often misunderstood with thoughts of a ‘visible image’ being acceptable. The required product goes far beyond that with concern for resolution, density and residual chemicals. There should be three generations of film, an archival negative, a working negative and a working positive. The archival negative should be silver halide stored in optimum conditions, ideally in a separate building to counter disaster threats, and used only to renew the working negative if it subsequently suffers from copying positives. The aim is not only for a long life film but is for the resolution of the archival negative to be high enough to allow several generations of copying before illegibility becomes a problem. That
way the image is preserved far into the future. High standards to ensure longevity are crucial to the success of any image substitution programme and have a direct bearing on cost.

CONCLUSION

We can conclude from this discussion that microfilming is a viable option for preserving the image of material which is at risk because of a deteriorated state and for protecting fragile and heavily used material. If an institution considers all or any part of its holdings to be of permanent value it will establish a preservation policy and strategy. The strategy will provide an approach from many directions but should include microfilming to capture the image of material which is considered to have no intrinsic value and which is at risk.

RELEVANT BRITISH STANDARDS

BS 1153: 1992 Recommendations for processing and storage of silver-gelatin-type microfilm.


BS 4657: 1990 Method for determining the resolution obtained in microcopying. (Identical to ISO 3334).


BS 6054: Glossary of terms for micrographics.
Part 2: 1983. Image positions and methods of recording. (Contains technical differences from ISO 6196/2)
Part 3: 1984. Film processing. (Identical to ISO 6196/3)


BS 6660: 1985 Guide to setting up and maintaining micrographics units.

BS 6872: 1987 Specification for visual densities of diazo and vesicular second generation microforms. (Technically equivalent to ISO 8126)

BS ISO 4087: 1991 Micrographics - Microfilming of newspapers for archival purposes on 35mm microfilm.

BS ISO 6199: 1991 Micrographics - Microfilming of documents on 16mm and 35mm silver-gelatin type microfilm - Operating procedures.


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AVOIDING THE PITFALLS OF PRESERVATION MICROFILM PROJECT MANAGEMENT

Patricia A McClung

INTRODUCTION

I have a question for you: Can you read minds or predict the future? If so, you may have just the right talent for managing large preservation microfilming projects. If not, I'm here to share some tricks of the trade that may increase your clairvoyant powers and enable you to avoid the pitfalls of managing preservation microfilming projects.

Having spent the last nine years planning and managing very large preservation projects, I know firsthand that Murphy's Law applies: if it can go wrong it probably will go wrong during the course of a project. The goal should be to minimize the impact of the crises and to build in safeguards and backup plans. Murphy's Law of Preservation Project Management need only be a challenge rather than a disabling force.

To start with I have two words for you: PLAN AHEAD!

Decisions and assumptions you make - or neglect to make - up front will make or break your project down the road. A preservation filming project is by definition a very complex operation requiring sophisticated technical knowledge and extraordinary management ability. Often the appeal of grant funds has landed very bright and well-intentioned people in what at least one talented colleague refers to as "the project from hell".

WHY IS ADVANCE PLANNING SO IMPORTANT?

In the first place, budget projects must be accurate. They won't be unless you know exactly what you will be doing during the course of a project. Projections cover project size, complexity, staffing requirements, workflow - both within the managing unit and across the entire organization. They also need to predict vendor performance (on both quality and schedules). Any of these things gone awry can wreak havoc on a budget. (Horror stories later.)

Second, it is essential to gain the confidence and support of institutional directors and departmental managers. Because these projects cut across virtually every organizational unit of a library, success requires precise coordination and a commitment from institutional colleagues to solve problems along the way (and there will be problems - remember Murphy's Law).

Third, the projects require sufficient staff with appropriate experience and training. The work is both challenging and tedious - the schedule unrelenting. Only problem solvers need apply.

Fourth, projects are unlikely ever to have adequate space and all the necessary equipment - however advance planning is required to come as close as possible to the ideal. There are some very helpful checklists in the RLG Preservation Microfilming Handbook and other sources. Use them (in advance).
Finally, since high quality, long-lived microfilm is the desired product, a reliable filming vendor with relevant experience is essential. These can be very hard to find. Once found, they need to be secured—both on performance targets and quality standards—by a watertight contract.

The second mantra I can offer in addition to plan ahead is "communicate/manage."

In preparing for this talk I asked more than 40 managers I’ve worked with over the years for their worst pitfalls/project nightmares. The majority of the responses chronicled misunderstandings due to poor communications between libraries and either their filming vendors or other key people.

Every institution will structure its project according to the available resources and organizational context. Some will develop a "stand alone" approach in which most project functions are performed within the unit responsible for the project. Others will use a "matrix" approach that seeks to coordinate activities across a number of units in their library or repository.

In either case project staff will be responsible for:

- Selection of materials for filming
- Preparation/Collation/Targets
- Filming oversight (if not actual in-house filming)
- Quality assurance
- Cataloguing/record updating
- Accounting oversight
- Storage locations for all generations of film
- Packing and shipping to storage sites
- Computer support and training

All of these interrelated functions are critical to the success of the project. They all need to be managed—both at an over-arching level and at a day-to-day, nitty-gritty, detailed level. There are a number of helpful checklists, model forms, sample contracts and guidelines for this type of project management. Many institutions choose to develop a project manual tailored to their own situation, complete with step-by-step procedures, potential problems, possible solutions, work forms, etc. Some also develop procedures for tracking project costs and performance milestones.

Storage is one the most important responsibilities of a project manager, and yet it rarely gets the attention it deserves. It is hard enough to produce the film, inspect it, ensure its high quality, and do all of this in a timely fashion. Who has energy left to pursue and contract for off-site, environmentally controlled storage environments for the master negatives, as well as appropriate on-site storage for the service copy? However, proper storage is essential for longevity. Even brief exposure to moisture or to airborn pollutants such as those contained in paint fumes, can cause dramatic problems.

Another angle on the communication theme involves public relations; be sure to manage the press. One friend of mine at a major U.S. university is often asked when crossing her campus: Have you destroyed any books today? Early on, the preservation policy at her university was to disbind brittle books to facilitate filming and discard the originals. When the faculty noticed that their cherished collections were systematically being converted to film...
and destroyed in the process, there was quite an uproar. Library staff learned the hard way the importance of working with their constituents - educating them about the problem of brittle books and the limited options for reformating a badly deteriorated volume. They now minimize the number of discards and produce some paper copy replacements in addition to the film copy, when it appears that the demand warrants the extra expense.

POTENTIAL PITFALLS

As the title of my talk foreshadows, there are many potential pitfalls of project management. With the luxury of hindsight - that unfortunately we don't have until it's too late - it seems the worst of them cluster around a few themes. As it turns out, most could have been avoided with adequate planning and good communication/management. Those that couldn't be avoided might have been mitigated by allowances in the overall plan of work and budget.

Pitfall #1: Budget estimates are inaccurate.

Either a manager finds there is not enough money to complete the obligations or there is too much money for the project. While we are inclined to believe that one can't be too thin or too rich, in fact too much money can be just as troublesome as too little.

I can offer a real life example: In our first cooperative filming project back in the early '80s, one of the participating institutions secured generous funds to film 6000 titles from a major history collection purported to include more than 36,000 titles. Once the project was well underway, staff were embarrassed to discover the entire collection consisted of only 5000 titles, most of which were still in very good condition and not in need of reformating.

Is there a solution?

I had an English literature teacher in high school who used to lean across her desk and shake her finger at our class, extolling us to READ, READ, READ. She's been dead for 20 years now but I can still hear her. I have my own simple theme for planning large-scale projects: SAMPLE, SAMPLE, SAMPLE. Though I'm not sure I want it to go on my tombstone, I am convinced that systematic random sampling at the planning stage is essential to a successful project. Surprises should be kept to a minimum. Project planners need to have accurate data about the collection proposed for filming.

Pitfall #2: Performance often falls short of ambitions.

This can happen for any number of reasons, but is most often caused by insufficient lead time for hiring and training staff, and for implementing the workflow across the institution. In many instances the institution is obligated by the terms of the grant to complete its commitments. If the grant falls behind, often the money has been spent on salaries without the performance objectives being met. Institutions are often required to absorb the difference - that is, to complete their stated obligations with no additional external funds.

There are solutions.

Track performance milestones. The microcomputer, that ubiquitous machine of the 90s, has made an enormous difference in how we manage projects - from spreadsheets for financial and production management to printshop programs for targeting - the computer is invaluable for scheduling and tracking.
Watch for bottlenecks.

Trouble-shoot and/or intervene early. Maintain good relationships with all others involved in the project and cultivate a feeling of involvement with all the key staff, regardless of where they report in the organization. Emphasize teamwork and continually focus on building and maintaining the team.

Pitfall #3: Vendor Failure.

This is an all too frequent occurrence. Either vendors fail to produce an acceptable product or they cannot meet the necessary schedule - throwing all other parts of the workflow off.

In one of our institutions the project manager shipped carton after carton of books to the filmer. Nothing came back. There were all kinds of excuses, which she believed. She was a trusting person. Way too late in the project, she finally went onsite and discovered all the books in dishevelled piles. The vendor didn't have a clue how to meet the guidelines, as his main experience had been with filming bank financial records. That trusting woman was out of a job for a long time after her managers found out what had been going on.

Remember: Vendors are selling services. Their claims must be tested. They should be asked to film sample materials in advance. Chances are that's their best effort. It is importance to substantiate that they have successfully filmed other similar materials, and that their clients were satisfied with quality and performance.

A related pitfall is that vendors might try to raise the price once the project is underway. The bid should be confirmed in a contract and preferably stable for the life of the project. If increases will be necessary over time, the contract should set limits up front. The contract must also specify a timetable, the quality standards, and procedures for rectifying mistakes and problems. Nothing should be left to chance. <Sample contracts are available from those who have learned the hard way.>

Also, cultivate a backup vendor. Chances are high you'll need it if only to supplement when your vendor gets behind. By the way, vendors have horror stories too about poor instructions from their customers, inadequate preparation of materials, and inability of customers to keep the work flowing to them in a steady, reliable way. Success requires that a good partnership be developed.

Pitfall #4: Quantity over Quality.

When speed of production becomes more important than quality, everyone loses. Preservation microfilming production must rest in a balance between the factory-level methods where error rates of up to 30% are considered acceptable (if not negligible) and the item-by-item methods we normally associate with conservation and restoration treatments on rare or unique materials. Libraries and filmers need to determine - together - what constitutes that optimum balance.

I'll give you an example: A project manager called one day for advice - she had been inspecting a new shipment of film from her vendor and was absolutely appalled at what she saw - the camera did not lie: it captured the destruction of many irreplaceable pamphlets step by step, frame by frame. You could literally watch the embrittled covers and pages being destroyed.

Even the best planned and managed projects run into trouble. After the 1989 Loma Prieta earthquake in San Francisco, the Stanford University Library preservation staff were shut out of their offices and files for many months. They managed to catch up and finish on time, capitalizing on incredible teamwork. In another university staff had to vacate their facility because of asbestos contamination. More an act of Man than act of God, but damaging to the schedule nevertheless.

And people get sick and sometimes they die. This is always sad, but especially so if they are beloved family members or people who work on your project. On a happier note people also have babies and take maternity leave. Given human nature this is going to happen. The lesson here is that any plan of work needs to build in cushions to allow for acts of God or Man. If none strike during a project, it can finish early or at a leisurely pace.

General rules of thumb: it takes six months to launch a big project; a filming agent will get behind (he has acts of God and Man too); and the wrap-up at the end of a project requires at least three months for locating all the materials, completing the inspections and cataloguing, dealing with those last ugly problems, paying invoices, and closing out the accounts.

My last Pitfall: Assuming you can "go it alone."

A few years ago we had a library new to preservation filming start its first project - not one of ours of course! Management was assigned to a good-hearted man who 1) knew nothing about microfilm or microfilming, 2) had never managed an externally funded project, and 3) was given no support for training from the library administration. His solution?? To telephone everyone in the country for assistance, guidance, expertise, and trouble-shooting. He drove us all nuts for two long years!

CONCLUSION

In conclusion: this all too-frequent tendency to go it alone brings me full circle back to my first point: plan well and with ample lead time. Communicate often and clearly. Involve others. No one was born a preservation microfilming expert, but most of us can learn what we need to know given the right tools, training, and support.

Disasters may happen, but most can be avoided. However - if you do have access to a crystal ball - use it!
INTRODUCTION

I would like to talk about the improvements I made to the microfilm standards of The Northern Echo. I think my experience is relevant to other filming programmes of contemporary newspapers.

I will illustrate my talk with slides taken from the actual microfilm and photographed during the filming process at the microfilm bureau.

BACKGROUND

I work at The Northern Echo, as a photographic librarian. The paper was the first half-penny morning daily newspaper (in England, at least) and was famous for its liberal views. It started printing in 1870. I have a strong interest in history and it seemed natural that I should take for my MA thesis the preservation of its archives.

The Northern Echo was archived in bound files from 1870 to 1968. In 1968 the paper was microfilmed and the originals discarded. I think that this was done because the bound file room was nearly full.

As I looked at the microfilm I realised that it was filmed to a poor standard and that it was badly organised. I decided to improve it.

I started from knowing very little about microfilm and microfilming. To learn more, I decided to visit a microfilm unit. First, I visited the microfilm unit at the British Library Newspaper Library (BLNL) at Colindale. Whilst at Colindale I realised how boring and repetitive the filming process is and yet how it still requires the full concentration of the operator. I was very impressed by how conscientious the operators were in applying themselves to their tasks. Whilst there I also learnt a lot about the cameras, lighting, exposure, film-processing and visual checking. I found it very useful seeing actually how newspapers are physically stored, prepared and filmed. I would recommend that anybody wishing to start a microfilming programme visits at least one microfilm unit. Two is better, so you can compare them.

I next visited the Echo's local agent, The Microfilm Bureau (North East), in Sunderland. I was shocked by the cramped and untidy conditions in which the operators worked and the appalling conditions documents for filming were stored. Even more worrying was that the Bureau managers were ignorant of the contents of the British Standard on archival microfilming of newspapers and were also unaware of what we wanted out of our film. This was really our fault since none of my colleagues had ever visited them or told them what we wanted.

STORAGE AND TRANSPORTATION

After my visit to the Bureau I changed the method of the transportation and storage of the newspapers prior to filming. We used to store the newspapers on an open shelf at the top
of a well-used staircase. I decided to store the newspapers at our office in large flat boxes which are then transferred to cardboard covers for transportation.

There are three benefits from this:

1. The newspapers are protected from any daylight, water and dust etc.
2. They are kept pressed flat and are protected from being folded or crushed.
3. Each folder contains an appropriate run of newspapers, clearly marked and calculated to fit to one roll of film.

To avoid holding and transporting large piles of newspapers they are collected monthly.

BUREAU RELATIONSHIP

My visits to the Bureau have also resulted in the establishment of a personal working relationship with the managers of the Bureau and the camera operator who is assigned to film the Echo. Any problems are resolved directly with the operator.

TECHNICAL STANDARDS

After ensuring the safe delivery of the papers to the bureau I needed to reorganise the actual order of the paper on the film. I started with the British Standard 5847: 1980. The 35mm microcopying of newspapers for archival purposes.

It is a useful introduction but it is at times rather general and occasionally ambiguous. Decisions have to be taken that are not covered by it and no guidance is given where a choice of alternatives is put forward. I compared our existing microfilm to the British Standard. I made a list of faults.

OLD FILM

The first sample was taken from 1983 [see Figure 1]. It is under-exposed and has excessive see-through. It is very poor quality considering that the newspaper used for filming was probably only three months old at the time of filming and had been set aside solely for filming.

Example 2: There were very few of the recommended targets used. There was only one on this particular film, apart from a handwritten date and title target.

Example 3: Another problem with the film was that the pages were often creased and folded and the presence of the rest of the pile could be seen. Also there are two pages to a frame, needing a large reduction ratio.

THE NEW FILM

As a result of my revision the following changes have been made [see Figure 2]. There is now one page per frame making for a bigger image. The reduction ratio is now 1:16; it was previously 1:22.
To achieve this the newspaper is now cut into single sheets and is filmed one page to a frame. This has the advantage of allowing the camera operator to roll a sheet of clear plastic over the page and hold it down ensuring no creases or folds remain. This is instead of ironing the paper as BLNL does.

The orientation of the page is now in cine film fashion, which means that the microfilm viewer has to be able to rotate through 90°. This is the orientation recommended by the British Standard for broadsheet newspapers.

It must be remembered that newspapers are designed to draw the eye down the page. Consequently I find it much easier to scan a microfilm as the pages move upwards. I find that regular users of microfilm readers often complain of feeling dizzy or sick. I think that this is due to the horizontal movement of the film. I feel that a vertical motion does not have this effect.

PROBLEMS OF CHANGE PAGES

A major defect of the microfilm was the idiosyncratic way in which the pages and change pages were arranged. No explanation of how it was arranged was given on the film. The Echo librarians were the only people who knew how the pages were ordered, and it had not been documented.

The Northern Echo has six editions and several change pages per edition. Even the supplements are editionised. Organising these change pages is crucial, if a full record of the paper is to be made, and not be confusing to read.

This is what the British Standard says about ordering the pages for filming:

"Numbered or lettered sections shall be filmed in numerical or alphabetical order followed by unnumbered sections such as supplements, magazine sections, comics, etc."

This doesn't mention editions or change pages. What do you do if the supplements are numbered?

I found better advice in a discussion paper of the Standards Institute (Number 4087).

"Newspapers shall normally be filmed in full including all sections and supplements. Should a newspaper have more than one edition, the principal edition shall be filmed in full including all sections and supplements; otherwise, an edition that is considered typical or representative shall be selected for filming. If separate local editions are published, they should be filmed immediately following the principal edition."

This is better, although it does not seem to suggest that change pages can be used instead of entire editions. And it does seem to insist that supplements are filmed as they are found in the paper. This can be very confusing, as all supplements are designed to be pull outs.

My solution has been to film the first edition in one continuous run without any supplements and then to film the change pages in their edition order. Any supplements are placed after
the change pages and keep their numerical sequence. If there are several supplements a regular order is established and maintained.

At the beginning of each reel I have included a guide to the editions, their order and notation and a brief guide to the regular supplements of the current paper. [see figure 3]. I do not expect every reader to pay attention to this, but it is there for the future.

So far my revised filming order has coped with recent changes. I hate to think how the previous system would have coped with about 10 change pages, an inserted flysheet supplement and a back-set supplement all in the same day; for that matter I wonder how they would be bound into files.

TECHNICAL ASPECTS OF FILMING

When I lent the Microfilm Bureau a copy of the British Standard I pointed out to them the technical requirements for density, resolution etc. I asked them to assure me that they could and would conform to these standards.

I have little expertise in these matters and I asked one of our own photographic technicians to verify that the standards were being met.

FUTURE

COLOUR IN NEWSPAPERS

The Northern Echo started to print in colour in July, 1990. We do not see the need for colour microfilm and I have yet to hear of a colour microfilm programme for newspapers.

I have argued before that by not preserving colour we are not in danger of losing crucial information. The text is the main reason we value newspapers. A black and white microfilm can adequately represent colour photographs, as colour is rarely essential to the understanding of an image.
Figure 1. Sample of film before revisions

Figure 2. Sample of film after revisions
EDITIONS AND SUPPLEMENTS OF THE NORTHERN ECHO

The order of filming

The first edition will be filmed in its entirety. Thereafter the change pages of each successive edition will be filmed in edition order. Within each edition, page order will be maintained. All supplements that are not numbered within the normal page sequence are filmed after the above.

The Editions

<table>
<thead>
<tr>
<th>Edition</th>
<th>Name of edition</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Edition</td>
<td>Teesside</td>
<td>none</td>
</tr>
<tr>
<td>2nd Edition</td>
<td>North</td>
<td>N</td>
</tr>
<tr>
<td>3rd Edition</td>
<td>North Yorkshire</td>
<td>NY</td>
</tr>
<tr>
<td>4th Edition</td>
<td>South West Durham</td>
<td>SWD</td>
</tr>
<tr>
<td>5th Edition</td>
<td>3am</td>
<td>3am</td>
</tr>
</tbody>
</table>

Notation

The first edition has no changes. All the other change pages are indicated by the printing of the notational letter or letters in the top corner of the page, near the page number.

Regular supplements of The Northern Echo

<table>
<thead>
<tr>
<th>Name</th>
<th>Day of Publication</th>
<th>Edition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport</td>
<td>Every day</td>
<td>All</td>
<td>16 pages tabloid</td>
</tr>
<tr>
<td>7 Days Plus</td>
<td>Friday</td>
<td>All</td>
<td>24 pages tabloid</td>
</tr>
</tbody>
</table>

Definitions

Change pages   Pages that have new or altered content from the previous edition.

Broadsheet   23 ins by 16 ins size page.

Tabloid       In The Northern Echo, tabloid pages are achieved by rotating the print through 90 degrees and printing on normal broadsheet paper to make two pages side by side.
NEWSPAPERS: A PARTICULAR CAUSE FOR CONCERN

Elizabeth A Melrose

Newspapers are a vital cause for concern. We are all so used to newspapers - something to look at while we travel to work or consume our lunch. A quick scan of the headlines and the business pages before we turn to the sports results and the star-guides. Continuity throughout the week and a good long read on Sundays. Gathering news has always been a profession. In the seventeenth century wealthy men employed agents to send them information and subscription news-letter services existed in London and on the continent.

Now newspapers are commonplace. You can lay them down for the cat, store the china wrapped in it. Eating fish and chips out of newspaper pokes soaked in vinegar was a national tradition in Scotland while I was growing up. At least in this way newspapers serve some purpose, but worse is that, in the places where long historic runs of newspapers are stored, we sweep up crumbling fragments of newsprint. As high technology moves into newspapers repositories, we use machines to do the job faster and thus support the Vacuum Cleaning Industry.

Despite all other distractions, newspapers are still read before being discarded, the crossword once again half completed. We remember what happened on the day that The Times put a photograph on the title page for the first time, or the scandal reported in the Daily Mirror as the tabloid changed hands for five pounds an issue on the London streets. As one whose father worked for the National Coal Board, I have to say that the main story in this morning's press on the sudden and immediate closure of so many pits in this country is absolutely appalling. It proves that newspapers are an indicator of the news of the day, no matter how devastating or accurate, no matter how biased or banal.

Newspaper reports can reveal contemporary accounts of national history. Two hundred years before the publication of Brian Keenan's book on his experiences as a hostage, the York Courant reported that Louis XVI and Marie Antoinette, arrested and held hostage by French Revolutionaries, were separated and deprived of writing materials. The Queen gave up her pencils and the King, seeing the iron bars and the blinds at the window of his solitary prison apartment, was distressed. Very little changes in the world.

More recent historical research puts less emphasis on purely political and constitutional events and has focused on areas of social history. Newspapers give a contemporary perception of all aspects of our past; a local dimension that can stand on its own account or illuminate some aspect of a wider historical question; the influences and attitudes of the period.

There is a wealth of evidence on crime, from lengthy accounts of Assizes to cases like the one in 1863 of "A little boy named, Benjamin Waterhouse, ... fined 6d. the value, and costs, for stealing some strawberries from the garden of Mr. James Anderson...." In the same issue it was noted that "An Incorrigible Ternagant.- A virago named Sarah Rhodes made her appearance before the Bench, (for the fifteenth time) for disorderly conduct ... She was sent to prison for seven days." This is reporting that can lead historians to further work, not only on the official response to this independent lady of spirit and others like her, but also to the underlying social conditions of the time.
There are lonely hearts columns - "Reference through solicitors only" - and advertisements for popular entertainment. Exactly a hundred years ago tonight families could have visited Charles Clarke’s Grand Circus at St. George’s Field, York, and thrilled to "The Grand Fairy Spectacle of Cinderella" along with the "Expensive engagement of David Abby Seal, the Prince of Jesters, and Storelli, the Funniest Fiddler in the World." In summer, hoteliers from the Yorkshire coastal resorts encouraged visitors to the seaside through the newspaper columns. The proprietor of Taylor’s Crescent Hotel sent omnibuses and cabs to the railway station to meet all the trains to Filey, "the most Salubrious of British Watering Places".

Newspapers are also an important source of information on the commercial life of any district or town. Present-day readers, tradesmen, businessmen and shopkeepers advertise their consumer goods - "Extraordinary bargains in Clocks. Every one tested and guaranteed. Nickle-cased Timepieces 2s., Alarms with stop action 2s. 9d ..." in 1894 - and the ubiquitous cures for every conceivable illness - "Holloway’s Pills are the best remedy known in the world for the following diseases: Ague, Asthma, Bilious Complaints, Blotches on the Skin, Bowel Complaints, Colic ..." and so on through the alphabet of sicknesses to "Ulcers, Venereal Affections, Worms of all kinds, Weakness, from whatever cause, &c., &c... There is a considerable saving by taking the larger sizes."

This is a minute rag-bag of fascinating detail that is duplicated in historical local newspapers throughout the country.

However newspapers are a cause for concern not only because their contents catch the eye. The study of local history has dramatically increased at every level, from enthusiastic amateurs attending adult classes, to primary school children struggling with the requirements of the new National Curriculum, to University degree course students. For all these, articles, advertisements and comment extracted from the pages of the press ring with an immediacy that cannot be had from secondary sources.

It is fortunate for anyone researching the nineteenth and twentieth centuries in a local area to discover that newspaper files have survived. But where, what kind of files, how complete, in what condition? It seems reasonable to hope that all the facts and human stories contained in their columns should be available for our delight and study - not that they should be unreadable or end up as crumbling shards of paper at the first untying of a brown paper parcel.

Here it is relevant to remind ourselves that, when we enthuse about the wonders of newspapers and the information that they contain, what we are really concerned about is original news from an original fragile document. Everything that we, as custodians and users of this material, must do should be designed to protect this document while allowing free and total access to the information that it contains. And of course doing all this at no cost.

This is the theory!

For the care of newspapers is not easy. Nowhere is this more apparent than in our public libraries, where long original runs of newspapers have been traditionally preserved. In York Central Library, in one of the most historic of cities, we have a basement full of local newspapers, bound and un-bound, from the earliest volume of the York Courant of 1728. Our readers find newspapers difficult - the staff find newspapers difficult. Problems which will be familiar to you all.
It has not always been simple to discover whether a relevant newspaper file exists, or whether it is kept in private hands, in publishers' offices, in archives or in a library. Even if a researcher did manage to track down a title, there could be the difficulty of access. Newspaper offices have few facilities for the historical researcher. One particular newspaper covering the Easingwold area of North Yorkshire is bundled in the publisher's attic. Their condition has so concerned one of my customers that, from the time she became interested in the history of her village, she has tried to make up her own file. Older issues have been donated to her by neighbours in the village.

There are other difficulties for the customer, even if access is welcomed. Hard copy newspapers cannot be sent on loan between archives or libraries without a great deal of trouble and likely damage to the large bound volumes. The reader must travel to the place where the original newspaper is held.

Storage areas in libraries and other resource centres can be inaccessible and over-full. One NEWSPLAN officer has some pictures of newspapers stacked up in a Gents' toilet. Our own basement is three floors down from the Reference Library. The racking is the preferred vertical style but it is high, so when our staff say they are going to flex their muscles, you can believe them. There is a service lift to transport the volumes to a point of access close to the Reference Library, but the work is still strenuous. Reliable customers are allowed to read the 1910-1950 massive original volumes of The Times in the basement as a form of staff-preservation.

Storage, the right conditions, horizontal filing, the correct temperature and humidity ... Don’t even mention the fire risk, or in our case the chance of flood as occurred in our strong-room only a fortnight ago ...: And we move on to conservation or, every librarian’s concern is an opportunity for the Vacuum Cleaner salesman.

Eighteenth century newsprint may have survived well but it can be prey to other depravations. We once surprised a squirrel munching through issues of Punch. Other creatures have nibbled at precious issues of our earliest local newspapers. We all know the shelf life of late nineteenth and twentieth century papers. Modern newspapers become brittle in light and heat and they disintegrate.

All original newspapers react badly to bad human handling. Can we be sure that the days of roughing the volumes up, bringing them to the customer, slapping them face down on a flat-bed photocopier, leaning on the fragile pages, and writing with biros are over? What reader or member of staff can say that they have never heard the tear of a page or seen the edge of a margin break away in a volume where two sizes of newspapers have been bound together. Original newspapers are at risk and have for some time been a recognised cause for concern.

Microfilming the newspapers has been a familiar option for many years in dealing with an intractable form of historical evidence. It has provided some of the answers to the storage and preservation problems of newspaper repositories. It has solved some problems and created others.

There are the daily problems of microfilm usage in a busy library or record office. Readers do prefer to see the original page. They are often nervous of the film and find the machinery intimidating. Every machine appears different to them and they are slow to gain a familiarity with the knobs and switches. The large format gives problems as scanning is difficult and
time-consuming. Readers soon forget the instructions. Our library gives assistance to very many students who have never seen a microfilm-reader before. After a survey of the time spent helping the public I discovered that I was spending an average of ten minutes per customer - not fetching the reels, not explaining the text or finding out more material for them - but merely showing them how to thread the film.

The reader may not be able to touch a nineteenth century newspaper, but with the microfilm there is that look of the original on the screen. This is missing from more sophisticated and expensive text copying. More important, every time the film is used, the original has another respite. Fortunately, since the choice is often one of using microfilm or nothing at all, some of the antipathy to microfilm among the public is easing. Customers are receptive to patient explanation and they are often so delighted by finding the detail that they are seeking that the effort is made worthwhile.

There is the need too for the staff to learn not only how to use the machines, but how to clean and maintain them in a dusty environment. And what to do when they go wrong. At one national meeting I listened to the arguments for the benefits of motorised down-projection microfilm-readers. And yes, they are excellent for people with bi-focals. But our staff have another view. I had gone to the meeting leaving our own down-projection machine in pieces in the care of one very annoyed Senior Library Assistant flourishing a screwdriver. I myself have sorted out a Regma reader-printer while holding a telephone to my ear, listening to the instructions of an engineer at the other end of the line. Always welcome the Service engineer with a good cup of coffee is my first law of paper jams and toner slip-ups. There is nothing like a machine when it isn’t working.

There has been some bad microfilming in the past. If microfilming is not done properly the first time round it is very likely that the newsprint may have crumbled away and disappeared. Some of our newspapers were filmed on microfiche of very poor quality. Not everything has been the fault of the filming. The tight binding of many early newspapers can make it impossible for the text in the central guttering to be filmed legibly.

There are specific stupidities also. How I dread to hear the complaint, "I can’t get the reel on the spindle ..." I still hold a Stanley knife as a standard piece of equipment to cut square holes in the round sides of microfilm reels.

But all this is better than not having the resource and not being able to share it with the people who show interest in the events and people of past times. In fact it would be wonderful if this prime historical source material could be used more widely and more easily.

We must keep examining every kind of solution and it may be that a mix of care and attention, the newest technology and new ideas in preventive conservation will help to preserve the news of the past and of today for the future. Above all, those people concerned with this most rewarding of contemporary comment must keep talking - so that old tested ideas can be recycled, new ways forward discussed and the high cost of conservation and preservation be held to a minimum.

Over the last eight years since Rosemary Wells was recruited as the first project officer, NEWSPLAN has looked at many of the concerns posed by newspapers. As Chairman of our NEWSPLAN Implementation Committee in Yorkshire and Humberside, I can say that NEWSPLAN made all the authorities represented on our committee look far more closely at their newspaper retention and conservation policies. We have examined the procedures that
we had and, within severe budgetary constraints, many of us have been able to rationalise and further the work involved in preserving our local newspapers for the benefit of the public. We were encouraged to look at what we were doing and to examine our standards of operation.

We are funded by the Yorkshire and Humberside Joint Library Services and one advantage of their overseeing our Group is that they are reminded annually of local newspaper collections, NEWSPLAN and the need for resources. We, on the other hand, are continually forced to consider our future plans and justify our existence as a regional committee ... and our expenses.

After the publication of our Report in 1990, our members agreed to "report at regular intervals to the British Library Newspaper Library with information to update the NEWSPLAN project officers' reports ..." Each Committee member was noting those changes in their files of local newspapers and microfilms that had occurred since Andrew Parkes, our Project Officer, had listed our regional collections.

We wanted to publish a booklet of these amendments, prefaced by an introduction on the work of the Implementation Committee and by short individual statements from each member authority. Most of us are suffering from cuts in funding, so the Annual Report gave each of us a deadline for examining how we had progressed in this context and for setting a standard, however modest, against which to test further gains in the next months. In this way we attempted, as we might say, to counter the successes of the Vacuum Cleaning industry.

While the Annual Report and Update was being prepared we learned to work together as a Group actively involved in local newspaper collections in our own libraries. We shared our experiences and the different ways in which we were able to promote the aims of NEWSPLAN to our colleagues and the resultant accommodation of the ever more demanding public. Some co-operative ventures between adjoining authorities were considered.

By being part of a network concerned with newspapers, we heard the national perspective that would otherwise have passed us by and we often discussed items that had been mentioned by other regional NEWSPLAN Committees. This has often meant our taking part in highly relevant topics beyond our immediate terms of reference. One of these initiatives was the drawing up guidelines for Choosing a 35mm Microfilm Reader. This issue had been brought up by members of the East Midlands NEWSPLAN Implementation Committee. It was discovered that the Mellon Microfilming Project of the National Preservation Office (NPO) was also involved in a similar exercise and hoped to publish a leaflet that might bring some pressure to bear on microfilm reader manufacturers. I was elected onto a working party co-operating with the NPO. Because of this, our experienced Committee members were all encouraged to read the draft leaflet and comment on it. Two of the responses, both from archivists, were especially helpful in this instance, including considerations of the safety aspect of many machines.

The majority of our members are from the Public Library sector, so it is salutary to hear the views of the academic librarians and of our representative from the newspaper press office. This is a two-way process. Through the LINC NEWSPLAN Sub-committee, Leeds University Library heard that the Mellon Microfilming Project had relaxed its rules and would in future give grants for microfilming newspapers that are not included in NEWSPLAN.
We changed the venues of our twice-yearly meetings and have thereby seen other libraries including a demonstration of the Northern Echo PANDA (Public Access to a Newspaper Database and Archive) Project on CD-ROM. Next month we intend to visit a microfilming bureau.

There is much to do, not only in our individual collections but within the Committee. We are already preparing the second Annual Report and Update, building on our experience in publishing the previous booklet. This will happen while we await critical comment on the use of the Scottish Database LIBPAC, which may be the way forward as the national database for all the varied NEWSPLAN systems.

In view of the fact that our Committee responded this year to Selwyn Eagle's Report on the Collection and Preservation of Free Newspapers, we shall emphasise in the Annual Report our individual practice regarding the "freebies". We have discussed at length the problems of the free newspapers, even to corresponding with the editor of the Metronews of Birmingham - a title that contains more hard local news stories than we see in many of our local freebies. Mark Higgitt sent us a marvellous summary of the principles on which his work and his newspaper is based - "While I hope it doesn't sound too righteous to say so, our belief is that every issue of Metronews should inform, entertain and promote the Second City, its vast multi-cultured cosmopolitan community and the lives of everyone who lives or works in it ... Certainly the competitive environment in which we operate - two TV stations, three dailies, one Sunday and a host of national offices - means we have to serve our readers with fresh news by digging it out and being prepared to examine issues or angles which the others, in their pursuit of instant and easy-to-process copy invariably miss altogether."

We also decided to conduct a Survey of the Microfilm Bureaux in the Region. A questionnaire was sent to 13 commercial bureaux, one library service and one county record office in the area. Of these seven bureaux and one library service were able to respond by completing the forms and these have been analysed and compared. The results will be printed in the Annual Report and Update.

Other subjects that we will address in the coming months will be the newspaper targets on microfilm, the multi-photocopying of recent newspapers for educational purposes, newspaper cuttings files and a Survey of Alternatives to Microfilm in relation to Newspapers compiled by another of our Committee.

This is what our group has done to concentrate our minds on the subject and on the question of standards - of acquiring newspapers, what to do with supplements and change-pages, standards of filming and of targeting on those films, standards of preservation of newspapers and of news-cuttings.

We take the message back to our authorities that newspapers are worthy of our concern and that there is a need here for resources and time for planning. Naturally we were not successful all the time! Financial restraints of all kinds with us and at British Library ensured that preservation microfilming and the filling of gaps in our historic newspaper runs did not proceed as fast as we would have liked - at least it is proceeding. We are committed as should we all be. One less vacuum cleaner in newspaper repositories - this should be our aim.

As the poem quoted in the Newcastle Courant in February 1876 states so eloquently -
PAPA, WHAT IS A NEWSPAPER, AND WHAT DOES IT CONTAIN?

News from all countries, and climes, my boy.
Advertisements, essays, and rhymes, my boy.
Mixed up with all sorts,
of flying reports

And published at regular times, my boy.

Statistics, reflections, reviews, my boy,
Little scraps to instruct and amuse, my boy.
And lengthy debates
Upon matters of State
For wise-headed folks to peruse, my boy.

... Lists of all physical ills, my boy,
Banished by somebody's pills, my boy
Till you ask with surprise
Why anyone dies,
Or what's the disorder that kills, my boy.

Newcastle Courant 18 Feb 1876.
Quoted by M Milne in Local Studies Librarian 1/2, 1982.

It is this prime source material, touching on the lives of all our yesterdays, that is our cause for concern for today and for tomorrow.

REFERENCES

I would like to thank all the members of the Yorkshire & Humberside NEWSPLAN Implementation Committee for their commitment to the work in which we are involved and which I have been able to describe in this paper.

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KNOW WHAT YOU'RE BUYING
AND HOW TO LOOK AFTER IT

Gerry Bye

All too often microfilm has been, or is, acquired with little thought for the purpose for which it is needed. I would therefore like this morning to consider what options are available to you and to ensure that you are aware of the very large number of variations currently on the market; and a few that have been available in the past.

To do this we must break microform into three component parts, which are format, coating and base.

We can briefly look at these, taking format first.

FORMAT. In photographic terms this means the size and layout of the image on to the microform and is the component which gives you the widest choice.

The smallest image which can be used for library and archive material is microfiche. The images are produced in rows on to a flat sheet of transparent material which today is normally 6" x 4", although other sizes have been available. The number of images put on to the sheet can vary widely dependant on whether the fiche has been created on a step and repeat camera or reformatted from other film stock. It is ideal for journals, reports, catalogues or manuals, where storage space is at a premium and usage frequent.

A variation of microfiche is jacketed microfilm, it is the same in format, but instead of being a solid sheet is a number of pockets in a transparent envelope into which film is inserted. These strips of film can be 16mm, 35mm or a combination of the two. It can therefore be easily updated as and when further information becomes available and can be printed down on to a conventional microfiche. It is ideal for such things as personnel files.

I have just mentioned 16mm and 35mm film and of course the usual way to find this is wound on to open spools in lengths of up to 100 feet, meaning that you can have in the region of 2000 images on a 16mm roll and around 1000 images on full roll of 35mm. Roll film is probably the most commonly found of all microfilms having been used over many years as it still is today, particularly as a preservation medium.

As an alternative to spools, you will find roll film which has been mounted into cassettes. Up until recently these have only been available in 16mm but are now becoming available in 35mm.

These are very user friendly as they come as pre-threaded units rather like audio cassettes, or they self thread on to the reader. The main drawback, however, is that a number of different types have been produced over the years, none of which is compatible with the others, so unless you have a collection of one particular type, reading equipment becomes prolific and expensive.

In addition to these, two more forms could be in your collections. Aperture cards are a single frame of 35mm microfilm mounted into a computer card and are useful for such things as maps or single items in a series. The other is Microprint or Opaque prints which are totally different from the previous types which we have looked at, because instead of being
transparent, the image is printed by offset litho on to white card. The biggest problem with this is the reading equipment, which being designed on the same lines as an episcope suffers a light loss in projection and no paper printer is available. As you can see the range of formats is extensive and the choice must be yours, but remember, the larger the image, the higher the quality and resolution you will obtain.

**FILM BASE.** Apart from the microprint which we have just discussed, the film base is the transparent material which carries the image.

Only two are available today. *Acetate*, a cellulose derivative, which has been used over many years, is subject to many failings. If kept in low humidity conditions it can become brittle and easily torn. At high temperatures it has a tendency to grow mould. With older acetates there is a tendency to curl and shrink. It does not splice or join to a high strength, even with modern ultra-sonic splicers.

Perhaps fortunately, very few suppliers are marketing acetate now. Instead *polyester* is used, which is a petroleum derivative, marketed under various trade names such as ‘E star’ or ‘Mylar’. It performs well, maintaining its shape, resists heat, humidity and a large number of chemicals. It will not tear, break easily or curl and does not become brittle or yellow with age and can be spliced to a great strength and permanence.

If you have any choice when acquiring film, then it is obvious that the selection must be polyester.

**COATINGS.** This refers to the light sensitive coating on the film base, in which the image is created and often referred to as the emulsion.

There are three which are in common usage today and a number of others which are less common. We shall today just look at the three most common.

**SILVER HALIDE.** Sometimes referred to as ‘Silver film’, this consists of silver halide crystals suspended in gelatin. These form the latent image when exposed to white light. It is then processed in wet chemistry to give the viewable image.

Most camera film used is of this type and it can be used to make copies in either negative or positive polarity.

**DIAZO.** This you will often see as a blue image, but it is also made in black. It consists of a thick plastic sensitized layer bonded on to the film base. The sensitization is by means of diazonium salts which, when exposed to strong blue or ultra violet light, form a latent image. This is then processed by exposure to ammonia fumes to give the visible image.

It is not widely used as a camera film due to its low sensitivity to light, but is frequently used for duplicating, giving a non-reversable image, that is, a negative original film giving a negative reading copy.

**VESICULAR.** This has an emulsion which consists of microscopic bubbles (or vesicules, hence the name) within a plastic layer. These bubbles are created from diazonium salts in the thermoplastic layer which, when exposed to light, decompose and create nitrogen bubbles. The latent image is made visible by application to heat.
Duplicate copies can be made on to this film which gives a reversed polarity, that is, a negative image renders a positive copy. The finished results when held to the light look milky and can be made in pale blues, greens and grey dependant on the film stock used. When projected on a reader however, they appear black and white.

**CONSIDERATIONS OF USE.** Of these emulsions only silver halide can meet archival or preservation standards, but the only if it is manufactured, processed and stored in accordance with the relevant standards. If these are rigidly adhered to, it is possible that silver halide film on a polyester base will last for 1,000 years and may well last in excess of that.

Diazo and vesicular films however at best can only be regarded as having a long term life. That means they will only last in excess of 100 years if stored in archival conditions, and are not used on a microfilm reader for more than 3 hours in any 100 year period. For working copies vesicular films are very stable to light and durable, but can be damaged by excess heat and undue pressure, particularly localized pressure. Diazo copies are prone to fading and, depending on their quality, could according to fade tests become unusable with anywhere between 3 to 300 hours usage on a reader. They are reasonably durable in use and relatively inexpensive to produce as a copy. Some users prefer a blue version of this film as being kinder on the eyes.

Although silver halide working copies cannot be considered archival for obvious reasons, they may be capable of lasting a very long time (that is if your users are not too aggressive with them) but are prone to being easily scratched on a microfilm reader. It can develop microscopic blemishes in the form of red/orange spots and is subject to fungus unless processed correctly and stored in reasonable conditions.

Great care must of course be taken when handling and storing your film no matter which you have selected.

**STORAGE.** Well, you may by now have purchased, acquired, or had film of some description thrust upon you. At this point your problems are beginning, that is if you want your film to last anytime at all.

Unfortunately, it is not generally appreciated that microfilm requires as much, if not more, care and attention than your rare books and manuscripts. Have you given any thought to yours? Over the years you could have collected film which will destroy or at least shorten the life of other film, film which will deteriorate the paper of your books and even film which can self ignite.

We will look at modern films in a moment, but let's first look at two film types to which you need to pay particular attention. These may already be in your files.

Some of the older vesicular films can emit minute amounts of hydrogen chloride which does not deteriorate the film itself, but which will accelerate the destruction of other types of film. It also attacks paper, card and accelerates rusting in metal. For this reason the quotation from the manufacturers is that they recommend it should be stored in bleached cardboard boxes, coated inside and out with polyethylene (in current terms a plastic box will suffice). Spools should of course also be made of plastic. These should then be stored in cabinets made of wood or steel coated with lacquer, enamel or other corrosion resistant finish.
I would then recommend that you do not store them in the same room or area as your books and that they should be on a separate air conditioning system.

The second of the older films which I must mention and which you must take most care about is nitrate or cellulose nitrate film. It has not been manufactured since the early 1950's, but you may have some in your collections, not necessarily in microform but as cine film or larger format negatives. Under certain high temperature conditions, there are cases of this film spontaneously combusting. Notwithstanding this, as it deteriorates, it gives off toxic nitrate fumes.

You may be asking 'How do I tell if it is nitrate'. In the transitional period from nitrate to safety film, the word 'Safety' or a capital 'S' was marked along the edge of appropriate microfilm. Regrettably this now seems to have been dropped by most manufactures of microfilm, although it is still widely used on larger photographic films.

You will therefore firstly have to determine a rough age of your film and having done so, be suspicious of any older film not marked in some way as being safety. There are tests to determine whether it is safety film or nitrate and I cannot recommend strongly enough that you seek professional advice if you have any suspicions about your film.

I think we can now look on the brighter side and consider storage of your modern microforms. Unless you are looking towards full preservation storage there are a few simple rules to follow.

The three different emulsions which we have looked at, diazo, vesicular and silver for long term storage each require different levels of humidity and temperature. This is generally impractical for storage of medium term or working copies in the average library or archive, so you should be aiming for a compromise in which your microforms will not suffer too badly.

It is recommended that a relative humidity of 30% should be maintained with a temperature not in excess of 68°F, although lower temperatures are preferable, with as little fluctuation in both as can be achieved. Within this environment microforms should be stored in housing made of non-combustible material such as anodized aluminium or steel which has been coated with lacquer or enamel. It is not recommended that wood or pressed board be used as they are not only combustable but may well give off undesirable vapours.

Within the storage system, films of different generic types, such as diazo and silver should not be filed in the same drawer and preferably not with the same housing as there may be a harmful interaction between them.

All microfilm stored should be wound onto non-corroding reels such as plastic which do not give off reactive fumes. The film should then be secured with a collar made from acid and lignin free card and placed in a card box which is also acid and lignin free. These should then be stored on edge.

Microfiche should be contained in a paper or card pouch which is acid and lignin free and again stored on edge.
Remember it is also desirable to protect your film from light. This is particularly so in the case of diazo film and all forms should be stored at least 6 inches from floor level to protect them from dust and grit.

I have here only given you a very brief introduction into 'Know what you're buying and how to store it', as you can see it is a subject which can be explored in great depth, and indeed many books and standards have been written on it.

REFERENCES

British Standard BS ISO 6199: 1991

British Standard BS 1153: 1992
Recommendations for processing and storage of silver-gelatin-type microfilm.


ANSI IT9.5-1988 Imaging media(film) - ammonia- processed diazo films - specifications for stability.

REPETITIVE WORK - THEREFORE MOTIVATE YOUR STAFF

David Meredith

In terms of bureaux, we are one of the larger; in terms of business size, we are relatively small.

One might ask what has motivating staff got to do with "Microforms in UK libraries". A good question, what indeed? The answer is good microfilm is almost a guarantee from motivated staff. Put in another way - bored staff equals bad microfilm.

The title of the talk was to be "Boring work - first motivate your staff". I cannot accept that microfilming has to be boring. Repetitive yes, many jobs in life are. With the right motivation, however, staff may even enjoy this work. There's a thought!

Staff motivation begins before they even become staff, in other words at the recruitment stage. There are many ways and media to advertise for your vacancies. The skill is to make the job sound different, appealing, unusual. This immediately attracts those who are looking for something different. The next stage is the dreaded interview - who likes interviews? If you are a boring employer, you will attract boring staff. We at Profile give a conducted tour of the relevant work areas, encourage discussion with staff and show the full process involved in the different areas.

All this is aimed at a kill or cure approach. It saves time in the long run. The candidate has no idea when they arrive if they really want the job. By the end of the interview, such an approach is likely to give both a good idea.

Similarly - now no longer a candidate, but now the recruit and the first day has arrived. Why should it be a trauma for them? You are sowing the seeds of a long term investment here. Handling staff relations, I conduct an induction chat for the beginner on the first day. This aims at being relaxing, informative, and encouraging. Directors' names and roles are explained. A handbook of information, history and rules is provided. Wage arrangements, security, personnel support, etc. are all discussed.

So, our new staff are now here, training, and determined to make the job a life-long career. That depends on those in charge. Incidentally, we have developed a training manual that covers all routine procedures in every section of microfilm production.

What is this place like where people "do" your microfilm? We have an open-plan layout (no walls and corridors). This creates space, light, and general activity awareness. Background radio music is provided, and we even have carpeting on the floors. Out tearoom/restroom has chilled cans vending (no cost to us!), self-serve hot drinks, and 'outside supplier' of snacks, cakes, and fruit on sale at tea breaks. So, as you start to see, this "job" can't be so bad after all. The environment and conditions are pretty good. By the way, it's never a bad thing for the bosses to be seen with sleeves rolled up, heavily involved from time to time. After all, we all form part of the same team, and all need each other to succeed.

It is our aim to develop staff into skilled specialists in their own sections. This creates a feeling of importance and competence, rather than never being at one task long enough to show promise. Vacancies are circulated internally giving chance for added experience, and therefore possible eventual promotion. A grading scheme operates for wage reviews, where
quality of work, quantity of work, attitude, length of service etc. are all given scoring points: the more points scored, the more wages per annum.

An arrangement somewhat unique amongst microfilm bureaux is our 'joint staff council'. This comprises a group with one representative from each section, ie. Admin/Sales/Preparation/Filming/Process & Editing/Finishing and Quality Control. They meet for two hours every other month in work time. Each successive meeting is chaired by one of the three Directors, in rotation, and staff grumbles, requests and anxieties are discussed. Such a forum prevents undercurrents of discontent, keeps management in touch with potential difficulties, and enables direct feed-back from Directors on company position on any issue. It's brilliant and it works!

In addition to the council, we have a quarterly newsletter. It is edited by a mystery person "T.B.S.H." (who happens to be myself). This gives opportunity for light hearted references to staff and all Directors alike. It contains company news, plans and achievements. It also highlights stories of staff achievements either at work, or in their social activities. Cartoons are included along with trade work, wordsearch puzzles, and press cuttings on such topics as smoking at work. Its publication is always warmly welcomed, creating further improved staff relations. The secret of this is that it is another vehicle for the vitally important communications between all in the workplace.

Motivation can also be created in other ways such as social events with visits to TV audiences, night clubs, theatres etc. This enables staff and partners to see another side of each other, and discover we really are human beings after all.

With Profile now in its 22nd year, we have always recognised and rewarded long service. Every member completing 10 years service is presented with a small gift relevant to their home or leisure interests. It shows we care, and that they are appreciated after all.

The true core of our ability to motivate staff at Profile is centred around a management attitude to teamwork. This in turn revolves around communicating, encouraging and rewarding staff for their contribution to the workday. Unhappy staff can very quickly develop into bored staff with disastrous consequences.

Most of what I have described are direct or indirect forms of motivation that cost very little. You cannot alter what is required to produce good microfilm, but you can certainly influence the atmosphere in which it is carried out. All of the described approaches have served to keep Profile staff suitably motivated, contributing to the high reputation we enjoy for our microfilming services.

Finally, remember, the most valuable asset is your staff, value them and reap the reward of loyal service.
FILM - GETTING BETTER ALL THE TIME

Andy Pitworth

In reviewing the general title, "Film - Getting Better All The Time", we need to consider the film as a complex package of a number of subsystems, each of which has its own unique but vitally important role to play, but some of which tend to get overlooked or taken for granted. I shall attempt to discuss all of them! That certainly reflects the view taken by Kodak, throughout the continual development of our microfilm products.

We will not look in any detail at the history of microfilm itself - we all know the stories of filmed messages tied to pigeons legs during the Siege of Paris, and the early work of John Benjamin Dancer. Suffice to say however that Kodak, through the creation of the Recordak Corporation in the late 1920s, brought the first commercially viable system to the marketplace, primarily for use in the banking area.

The Second World War contributed significantly to the growth of the industry and an expansion of applications, two coming to mind. The dramatic development of the 35mm aperture card system, brought about by the Department of Defence in America, and the greatly increased exposure to members of the "general public", through the V-Mail system, through which all American Services mail was sent, in both directions across the Atlantic, in microfilm form, for local reprinting at the receiving end. We still have one of the original V-Mail printers stored away, incidentally.

Enough of reminiscences however, let's talk about film developments over the years, but since we only have half an hour we will ignore the other parts of the system, equally important as they are, such as the processing chemistry and machinery, the readers and reader printers and other duplicating equipment. We can ignore them here, but in designing a film, and I use the word designing deliberately, Kodak cannot ignore them. All play a crucial part in shaping the way we make a product to match the exact needs of the end user. This applies to both current systems and, as far as we can predict them, future developments. Our readiness, in film terms, for scanning and other technologies, is a classic example of this long-term approach.

You may recall that we launched the first of the Kodak 'Imagelink' films, Grade 1461 'Imagelink' HQ as it happens, late in 1989. This was the first of the 'Imagelink' series of four new films, each of which has a particular specific area of use, HQ and Fs being for normal document filming applications, CM: for wet COM devices and CS for high speed cheque sorter microfilming equipment.

Although the first launch was in 1989, this was in reality the culmination of several years development work, during which the major design improvement parameters were established. I can personally assure you that specific European needs and views were incorporated in establishing those parameters.

Our major aims could be summarised as an intention to produce a film series which was perfectly built to suit the specific demands of new emerging technologies such as scanning and subsequent conversion to such devices as image storage on Optical Discs, whilst simultaneously making improvements to the films for use in normal filming operations. The obvious benefits to users such as yourselves included greatly improved image quality, particularly from poorer quality documents, and greater ease of use.
Whilst we had achieved all of the aims we had set out in the 'Imagelink' development programme, that does not of course mean that images filmed on our previous films will not work with the new technologies. They will, but the new films are better.

Nor have we stopped development work to rest on our laurels. We are continually making small, carefully evaluated changes to our films, in the normal course of production, as our knowledge and expertise increases. Most of these changes you may never know about, until we make our next major change in technology.

I am sure that you will also recognise that we are using the word 'Imagelink' throughout our product range. Newer equipment is also designed to work at its best with our current film range. As I said earlier, we cannot work on only one major component of a system in isolation, if we wish to maximise benefits to our users.

So, let us look for a while at the major film components.

The base, or support, is commonly thought of as "just something to hold all the other components together". This is most definitely not true. Over the years it has been made, in the main, from three different materials. The first was nitrate base, a highly dangerous, inflammable, maybe even spontaneously explosive product. I can assure you that we at Kodak have never used it for a specifically microfilm product.

The second was cellulose ester or acetate base, a much more stable product, but easily damaged by rough handling, and very easily torn in a reader. It served us well, but has been superseded by polyethylene terephthalate base, also known as polyester or, by Kodak, under the Trade Mark of 'Estar'.

We have used 'Estar' exclusively now for a number of years for microfilm products, others are following our lead. We made this decision for a number of reasons, primarily from your point of view because of its outstanding durability, dimensional stability and excellent storage properties, but also because we could see that the cost of products on acetate base were likely to rise at a faster rate than their 'Estar' based equivalents.

'Estar' also allowed us to produce films on thinner bases, which, where appropriate, permit increased storage economies and more document images per roll with less end of roll waste. It is also more transparent than acetate, thus helping achieve a clean, low minimum density image, a significant advantage in duplication, printing and scanning applications.

Several other compounds have been built into the base over the years, some of us are old enough to remember "grey base", the use of a dye in the base to reduce halation and thus sharpen the image.

So much for the base, or is it? Remember that we produce it in rolls typically 5 thousandths of an inch thick, maybe 5 feet wide and several thousand metres long. We are going to coat it with a number of separate liquid layers, simultaneously and in the dark, totalling maybe 2 tenths of a thousandth of an inch thick, which must be kept apart! Any irregularity in the base, however minute, will have a dramatic effect on the quality of the film you buy.

Plate glass makers and 'Estar' base makers both work with a hot viscous liquid as a starting point. How many times have you seen a perfect, distortion-free sheet of glass? We must achieve this target, and we do routinely! Perhaps now you may look at base in a fresh light?
Now we come to the coatings. Let's consider the back of the film first. A number of different coatings can be applied, for example a thin layer of gelatin to improve film flatness by balancing the gelatin coating carrying the emulsion, surface treatments to improve transport, or in older technology, dye pelloid coatings to act as both a halation protection layer and daylight load protection. We are particularly proud of the anti-static coating which we announced with the launch of the 'Imagelink' range of films. In excess of 90% of this coating survives wet processing, thus giving improved transport, protection from static discharges and, probably most importantly for you, keeping the processed film cleaner in use, whether this is to give a better looking screen image or to enhance the quality of reproduction of a scanned image.

Ignoring the various things that may be done to both sides of the base, let's now talk about the coatings on the front of the film.

Firstly, below the emulsion, we coat an anti-halation layer, we call it AHU, a Trade Mark, registered in some parts of the world. We won't discuss it in detail, suffice to say that, placed immediately below the emulsion it provides the best halation protection and also gives protection against loading fog. The trick is to get it to totally disappear in processing. Our latest version is so good we have patented the technology we use.

Now we come to the emulsion. We could talk for hours on this alone, but we will just skim the surface. In simple terms, we suspend very fine grains of silver halides in an extremely pure gelatin. But - you will remember that earlier I said that we actually design a film product to do a specific job. A professional market film such as Kodak 'T-MAX 100', whilst quite capable of recording the image of a document in true James Bond tradition, would not normally give you an image of the quality you expect from Kodak 'Imagelink HQ'. We need much finer grains and a thinner emulsion in order to reach, with 'Imagelink HQ', an image resolution capability as we have now of 800 line pairs per millimetre. 'T-MAX 100' achieves about 200 line pairs per millimetre at high contrast exposure.

By carefully controlling the grain size, by strict and complex control of the precipitation procedures when they are grown, and the mix of silver chloride, bromide and iodide, we can achieve both the desired resolution and also excellent panchromatic sensitivity, such that lines of different colours are all recorded properly. Older emulsion technology often had problems with reds and yellows in particular.

Unfortunately, and now we get into a situation somewhat like Gerard Hoffnung's famous wheelbarrow story, finer grains make for slower emulsions, too slow to be practical in microfilming. So we have to chemically modify the emulsion to increase its photographic speed back to a useful level. Unfortunately, chemical additions of this sort often cause fogging of the emulsion, so we have to add more modifying agents to prevent that effect.

At the same time, you the users need an emulsion with a higher photographic contrast than a film such as 'T-MAX', so we have to get that right as well. Not only that, but the contrast and speed must remain stable through a wide variety of processing conditions, maybe ranging from say 10 seconds at 110°F in a machine like the Cordell, through 23 seconds at 100°F in a Kodak 'Prostar' to perhaps 74°F for 90 secs in a deep tank machine such as an Allen M70 processor. If each is properly controlled, the resulting photographic properties of 'Imagelink HQ' will remain remarkably constant. The same of course applies to all four of the films in the 'Imagelink' family.
In achieving all of these features and more, we have made a number of other very significant improvements to the film. In technical terms, we have squared up the toe area of the sensitometric curve of 'Imagelink' film, simultaneously lowered the minimum density that the film can achieve, and also, with our new dye technology, made a film which lets you achieve clean characters and lines on the image more easily. It gives a crystal clear line image, which improves reader screen appearance and also makes duplication and paper printing much more easy to control.

Finally I would mention that we have made a number of other improvements which really mean that, except in high precision filming, camera tests at film batch changes are really a thing of the past.

That's dealt with emulsion technology, all we are left with is the topcoat or overcoat. Basically this is a thin layer of hardened gelatin, whose function is to protect the emulsion surface from physical damage. Like everything else associated with film making though, life is never quite that simple! It may well contain other compounds, for example, to improve transport and provide further static protection. It must also not be so hard that it prevents fast penetration of processing chemistry or restrict the ability to wash out the processing by-products or the residual thiosulphate ions, to achieve outstanding archival keeping properties.

Lastly, in this section, I would mention that we have again to look at the total film package, to ensure that all of the various compounds we have used will not cause you or the environment any harm in use, and they will not interact in any way in archival storage to reduce the long-term quality of the film.

Should you think that all of that sounds complex, and it is, just remember that a film like 'Kodachrome' contains between 15 and 20 separately identifiable layers in the emulsion pack, all contained within about half a thousandth of an inch.

Finally, we believe that we are now selling the best range of films, in the 'Imagelink' family, that we have ever produced. They are easy to use, give a great image, wash better than ever, even if necessary in cold water, are specifically designed for optimum scanning quality and store well. If you don't believe me, just go back and look at the films you made 15 or 20 years ago, but they were good then and still work perfectly well. We recognise though that every user's expectations continually rise.

Kodak firmly believes that you, the users, recognise our commitment and that is why, across the range of microfilming, prestigious accounts such as the libraries and archivists, the Mellon Microfilming Project, B-Link bureaux such as Profile and internationally recognised high quality micropublishers such as International Imaging choose to use our products. We are grateful for your confidence.

Whilst we are already geared for the future, in both film and inter-linked equipment, the story does not stop there. We continually make improvements; only occasionally do we draw your attention to them. As a world-wide corporation, Eastman Kodak spent $1,494,000,000 in 1991 on Research and Development. That's over $4 million every day of the year. Although I cannot tell you what our division spends, you may be absolutely sure that microfilm products receive their fair share of investment for our joint future.
CAMERAS - POSSIBILITIES FOR EXCELLENCE

Graham King

To achieve 'excellent' results from any microfilm camera we have to understand the criteria that makes microfilm 'excellent'.

In preservation microfilming the criteria differs from those met in most commercial applications. In commercial microfilming the main criteria is that the microfilm is readable and that it will last the required legal period, often only 7 years. In preservation microfilming we must strive to retain every detail of the document or volume and ensure that those details will be accessible for hundreds of years.

The important criteria in preservation are:-

Format
Reduction Ratio
Resolution
Density
Contrast and
Permanence

All of these criteria are controlled by the choice of film and two pieces of equipment: the camera and the processor.

In this paper we are only discussing cameras. It must be remembered that film quality is also dependent on good processing of well-filmed material.

We are going to look at each of those criteria in more detail and study how the microfilm camera affects them.

FORMAT

Microfiche - low reduction formats are acceptable.
Jackets are not acceptable
35mm film is acceptable
16mm film is not (generally) acceptable

By far the most popular format for preservation microfilm is 35mm.

When talking about microfiche I refer to masters generated on a step and repeat camera and do not include microfilm jackets which are not acceptable for preservation purposes.

Traditionally, 35mm microfilm has been the only accepted format for preservation microfilm but more and more institutes are realising that modern microfiche cameras can record images that meet or exceed all accepted 35mm standards.

It can be argued that retrieval from fiche is quicker and easier and that viewing equipment is less expensive and easier to use.

16mm microfilm is generally used for commercial applications and has the advantage over 35mm film that it is smaller and slightly cheaper but its disadvantage is that overall quality
is reduced as higher reduction ratios must be used. With few exceptions 16mm cameras are designed for filming commercial documentation not archival material.

Microfilm jackets consist of pieces of 16mm film inserted in strips in a transparent plastic wallet. Jackets are designed to be updatable and are ideal for personnel records etc. but because of their design it is impossible to obtain emulsion to emulsion contact during duplication which along with their flimsy nature makes them unsuitable for preservation.

It is important to appreciate that most microfilm production equipment available has been designed to capture modern documents at high speeds.

90% of 35mm microfilm cameras have been designed for microfilming commercial engineering drawings not old bound newspapers or valuable manuscripts. Several camera manufacturers have added a book cradle to their drawings cameras and called them ‘preservation cameras’. If you are considering purchasing a microfilm camera make sure that it is designed for the job!

It never ceases to amaze me how many archives entrust their valuable documents to the local commercial microfilm bureau that pay its staff piece rates and expect 1000 exposures an hour. Most commercial bureaux will produce excellent microfilm from bundles of invoices or delivery notes but do not have the equipment or knowledge to handle archive material. There are of course several exceptions.

However cameras have been designed for filming archives on 35mm including the ever popular Kodak MRD and now the GRATEK range of cameras.

Both the Kodak MRD and the GRATEK 35mm cameras have features that can adjust the frame size by changing the amount of film advance after each frame. This is an important feature that many of the converted drawings cameras do not have. It enables the operator to select a frame shape similar in proportion to the document or volume to be microfilmed.

With the advent of automatic microfilm scanning and digitising it is important to maintain a fixed frame size throughout a roll of film or section of film and beneficial to include the frame advance (in mm) used on the technical target or first frame of a section. Most scanners use leading edge or blip detection of a frame and operate best on fixed frame sizes. Some scanners have also trailing edge detection but this feature can be confused by the gutter shadow of a book or an illustration.

Variable pull-down or frame advance is important when selecting a microfilm camera but this should not be changed during the filming of a book or section. Select a camera that has an easy to set, accurate and repeatable frame pull-down. Variable or interchangeable frame masks are an important feature of preservation cameras. Masking is used in conjunction with the variable "pull-down" to control frame size and inter-frame gap.

Another useful feature to look for that affects the format is the ability to advance a frame without operating the shutter, in other words to generate a blank frame. This is useful to separate books or topics within a roll of film.

Some cameras can be converted to accept 16mm microfilm. This adds to the versatility of the cameras and may be considered a useful feature. The GRATEK range of cameras will accept 35mm, 16mm, and microfiche heads.
REDUCTION RATIO

Traditionally preservation microfilmmers have filmed at the lowest reduction ratio possible, in other words they have reduced the reduction ratio until the document to be filmed fills the available frame size.

With the greatly improved performance (resolution) of modern microfilm cameras it is normal to select one reduction ratio for a whole project even if some of the documents are smaller than others. This method improves filming rates (speeds) and minimizes operator errors. It also gives the user a better "feel" of the size of the original document. Generally preservation microfilming on microfilm and microfiche is undertaken with a low reduction ratio i.e. between 8X and 20X.

If a camera is to be used for 16mm microfilming or microfiche higher reduction ratios may be necessary. If the camera is to be used for recording transparencies, photographic plates, slides, stamps etc lower reduction ratios will be required.

Optional interchangeable lenses can be supplied with Gratek cameras to extend the standard range of the cameras to cover a range from 1:1 to 30X. All modern cameras have motorised reduction ratio control. The 'old faithful' Kodak MRDs have a hand cranked reduction ratio control with the crank handle positioned so as to cause maximum injury and discomfort to male operators!

RESOLUTION

Good resolution is vital! It is the product of a good lens correctly focused onto a film that is held flat and still. Good resolution results in good, sharp, in focus images.

The most common problem with microfilm produced in libraries and archives is poor resolution. Good resolution increases the edge definition of text and lines. An 'O' for example, filmed on a poor resolution camera, will have its centre 'filled in' whereas on a high resolution camera the centre will be clear. This example illustrates the increase in contrast between text and background. It is this increase that results in lower density of text (D min) relative to the background density (D max).

Films with a low D min and correct D max will duplicate and print well and produce acceptable results over a wide range of duplicator or printer exposures.

The advantages of high resolution are:-

More information is clearer and easier to read.

Master microfilms are easier to duplicate and acceptable results can be achieved over a wider exposure range.

Less refilms, as acceptable results can be obtained from a wider range of camera exposures.

Most GRATEK cameras are fitted with manually focused lenses. This enables the operator to focus on objects above the base board which is particularly useful when filming three dimensional objects or very large volumes that will not fit under the book cradle, a typical example being large parish registers that are best filmed single page on a shuttle above the
base board. Another example is microfilming old glass plates or magic lantern slides. This can be achieved by placing a light box on the base board and the transparency on the light box which conveniently lowers the reduction ratio, excellent results are achieved. Most cameras, however, do not have this ability.

DENSITY

Density control of preservation microfilm along with resolution is of prime importance. More preservation microfilms are rejected for poor density control than any other reason.

The best method of achieving good results is to employ and train a good camera operator. There are many auto-exposure units available that monitor the amount of light reflected from the document and adjust the camera lights or exposure time to compensate for changes in colour or texture. These units are not generally acceptable in preservation filming applications because of the nature of material we have to record. For example, no automatic exposure unit can detect photographs on a newspaper page or the discoloured corner of a manuscript. In a situation like this automatic exposure units will always strike a compromise. This compromise is often unacceptable.

The most suitable automatic exposure units project a "spot" onto the camera base showing the exact area being sensed. The operator can ensure that the device is adjusting the exposure of the camera to give correct density to the required part of the page, for example the text of a newspaper rather than the photographs.

The most popular method of exposure control is by measuring the reflected light from the document with a light meter. This is the method incorporated on the Kodak MRD.

Modern microfilm cameras have sensitive digital light meters that can project a spot to indicate the area sensed. The Gratek "search light" has a unique display consisting of red, amber and green LEDs that indicate when the illumination is correct.

THE CONGRESS CAMERA

The Gratek Congress camera has been specifically designed for use in libraries and archives. Some of its unusual features are:

1. Motorised elevation for easy reduction ratio changes.
2. Motorised forward and backward head movement to enable the operator to locate books, etc. at the front of the cradle for comfort.
5. The ability to rotate the book cradle and head for better gutter illumination of tightly bound volumes.
6. Automatically lifting glass to give extra page turning clearance for large or fragile bound volumes.
7. Microprocessor controlled camera head incorporating adjustable exposure time, frame advance and leader/trailer.
"Simply put, people prefer reading books and magazines." Books are tangible. They provide information for education and research. They can become old friends, cherished, loved and reread over and over again. Basically they can make you feel good.

Unfortunately a reel of microfilm doesn’t have the same effect. They are purely functional. You can not establish a relationship with them in the same way as with a printed volume. To use them a piece of machinery needs to be used placing the user and the medium always at one remove from each other. Stephen Salmon wrote that "... the use of microforms has been said to be like kissing through a pane of glass." In providing microforms in libraries we must do our best to make this pane of glass as invisible to the user as possible.

In order to preserve brittle and rare material and to increase and improve access we are reformatting increasing amounts of printed material. The advantages have been discussed already. It is becoming vital that we start selling the idea of microforms even more than we have in the past. And it must be said that many of the preconceived notions and attitudes about microforms are often held as strongly by the staff as by the readers.

Staff need training and support in order to combat the readers’ complaints such as headaches and motion sickness. "You have to use the microfilm" said in a bored and disinterested tone is not going to inspire most users to greet receiving a reel of film with much confidence. Generating staff enthusiasm is absolutely essential in combatting the formed attitudes of many users.

One of the first ways of helping staff is with in-house training. The staff who are working in public service areas need to know and understand the library’s policies both for acquiring and/or making microfilm. The training should include a brief introduction to reprographics generally. A tour of a filming unit to see the film being created and the care that goes into the filming process is useful. They should also be given instruction in using and have easy access to the bibliographic tools for the microform collection. Any feelings of inadequacy on the part of the staff put them at a disadvantage in dealing with even a simple request, let alone an irate and difficult reader.

Instilling enthusiasm with the staff can then be used to advantage in the public service areas. The users’ negative feelings can be combatted with simple explanations of the institution’s belief in the value of microproducts. Explaining that the original is now extremely fragile and using the microfilm is easier is one possibility. Pointing out that a particular serial run in the original is incomplete but on the microfilm the missing gaps have been filled by copying from another collection means that the film is the better copy. The ease of copying from film can be mentioned, particularly if the institution’s policies would preclude photocopying of the original for some reason such as date, size or condition. The attitude of the staff is essential. If they are convinced of the practical worth of the format, their own feelings will be communicated to the users to good advantage.

Another way of supporting services is by providing helpful guides to the collection. Signs, posters, guides play a role in making the reader feel more at ease in what may be unfamiliar surroundings. Making the path from the front door to the reading machine as logical and easy as possible should be the primary aim.
The area where the reading equipment is located is important. Unfortunately few institutions are in a position to have a tailor-made area available. Wherever possible, the area should have a low ambient light in order to maximize the image on the screen. The table surfaces should be large enough for readers to write without being too crowded. The number of machines needs to be carefully monitored, particularly if the library has an on-going policy of acquiring and/or creating film. The number of machines may need to increased to meet demand. However, care needs to be taken not to crowd the area with more equipment at the loss of necessary surface space for users. The tables should be of a reasonable height and it is useful to provide seats which are adjustable. This is particularly important if readers are going to be spending long periods of time consulting the microforms. It is perhaps an irony that reading equipment is often sited in an area far from the issue desk or other regularly staffed point, making it difficult, particularly during busy periods, for the staff to provide needed support.

Libraries have to deal constantly with the problem of the one-off reader. This person has never used microfilm before, or may have used it some years ago. He can't really remember much about it and certainly doesn't remember how to use the equipment. It is important to provide clear instructions on loading and unloading on or by each machine. Ideally these should be on the machine itself, although with many models this is difficult or even impossible because of the design. In these situations, a sheet of instructions which is laminated should be placed either beside the machine or possibly pinned to the wall above it. Failing all else, the reader should be handed the laminated sheet together with the film and asked to return both when he is finished. Providing instructions saves the user a lot of frustration, gives him more confidence to "have a go" on his own and often therefore saves on wear and tear of the staff in providing support.

Reader/printers should also have instructions on loading as well as notes which alert the user to possible warm-up times before copies can be made.

I'm sure that most of us have horror stories of the inventiveness of users, some of whom seem to take an almost ghoulish delight in trying to test or break the system. In one library, I watched a reader attempt to load a machine, which incidently had no instructions. He managed to thread the film on and started to wind on before discovering a problem. So he pulled out the half-unwound film, had a look and tried to load it back again. He still had a problem. He was working with material in a non-Roman script and couldn't figure out which way the film should be going. He became more and more perplexed until eventually a member of staff was alerted to the problem and went to his rescue.

Another user was spotted using a machine without having threaded the take-up spool at all and consequently a lovely pile of film was growing beside him on the floor!

One of the best tales is of the reader who was determined that he was not going to rewind the film back to the beginning. However, the take-up spool on the particular machine was fixed. Undaunted, he eventually returned the reel to the desk. The staff noticed a curious bulge in the box and on investigation discovered that he had managed to detach the take-up spool, spindle and all. Some helpful signs around the reading area could have helped each of these readers.

The equipment can pose as great a problem to the staff as to the readers. Their own reluctance to use the machines is a definite deterrent to getting them to promote the material. One way of helping staff to overcome their antipathy and become friends with the machines
is to establish a programme of regular cleaning of the equipment. Cries that this is not their job may come but the benefits in being able to use the equipment efficiently should be stressed.

A cleaning policy needn't, in fact shouldn't, be elaborate and needn't require a vast expenditure. A box containing the basic materials and supplies are modest. All these items together don't really amount to a high investment - this box cost under £20.00.

It should contain:

- a pair of white cotton gloves
- glass cleaner
- glass cleaning cloth or tissues
- compressed air
- puffer brush
- cotton buds
- cleaning cloth(s)
- one or two soft brushes
- sewing machine or silicone-base oil
- WD-40 (for major problems)
- glue for minor repairs
- log book
- list of instructions
- manufacturer's book(s)

The method of cleaning should be set out in the list of instructions in the box.

These include:

Check the moving parts. If any are stiff, lubricate with a small amount of oil such as sewing machine oil.

Wearing cotton gloves, clean the glass flats with the glass cleaner or glass tissues and inspect with the machine switched on.

The lenses should be cleaned by using the compress air or a soft brush.

The screen and casing should be dusted and cleaned with soap and water.

Occasionally the reflecting mirrors should be dusted.

The log book should be completed with the date and signature of the staff member.

Any servicing by the engineer should also be noted in the log book.

The benefit to the institution of such a programme can be high. Regular cleaning, every day or two days, will ensure that the equipment is dust free and therefore is less likely to cause scratching to the film. Cleaning the lenses will result in clearer images and happier readers. Potential problems can be detected before they become a major risk to the material. The staff in the reading areas maintain a constant relationship with the machines and can often solve minor problems themselves rather than relying on calling out an engineer.
Cleaning should not be confused with repairs. This should be done by trained staff. Service contracts should also be considered, particularly where several machines of the same make are held. They are particularly important for reader/printers.

Emergencies however do happen and for these a box of supplies should be kept in the office or behind the desk of the service area. This should include items such as:

- spare bulbs
- fuses
- glass flats
- extra lenses
- spare reels, boxes, fiche envelopes, labels
- splicing tape for emergencies only
- scissors
- blu tack (for retrieving fiche inside the machine)
- screwdriver
- paper for reader/printers
- toner cartridges

Developing a close familiarity with the machines is not possible for the majority of our users. It is possible however for the staff and performing regular cleaning and basic servicing is one of the best ways of giving them the opportunity to learn about the machines. If they have already been convinced of the worth of the collections, helping in its care and use should be equally important to them. Helping them to overcome their own inhibitions will go a very long way in helping the users.

We will never overcome the once-removed situation of microfilm, but we can make many more efforts to make it more approachable for both the staff and the users than it often is at present. Providing good quality film is one way, providing good and well-maintained machines is another, providing well-trained and confident staff is perhaps the most important.

REFERENCES


QUALITY ASSURANCE IN PRESERVATION MICROFILMING

Nancy E. Elkington

At its most basic level, quality assurance in preservation microfilming is the inspection process we go through to verify that we received the products we contracted and paid for. At its most elevated, it is the complex system of philosophies, agreements, and activities that must be in place from the time an item is selected for reformatting, through its physical preparation and targeting, through filming, through post-filming inspection and re-inspection after errors are corrected, and through the entire life cycle of all three generations of film as they are stored and accessed. However narrowly or broadly we define the concept, our purpose remains the same: to implement a set of actions that will be taken by library and filming bureau staff to ensure three things. First, that the master negatives we create will last at least 500 years in proper storage without physical deterioration or textual loss; second, that the printing negatives we make will be of sufficient quality to allow us to print acceptable service copies from them; and third, that the service copies we print from them will serve the needs of current and future information seekers and researchers as adequate surrogates for the original volumes.

Imagine for a moment that you've just received a shipment back from your filmer. You've got six cartons containing 50 or so monographs, the 10 reels of camera negatives, 10 printing negatives and 10 service copies. What happens next? Many institutions have a workflow that goes something like this: unpack everything, send the originals back to the reshelving unit, send the service copies to the microfilm reading room, send the camera negatives to storage, stuff the printing negatives back into a box and shove it in a back room, and send the invoice to the business office for payment.

Well, that works as long as you have an unshakable belief that together, you and the filmer have created a perfect set of films. That your preparations staff caught and corrected (or at least accounted for) every physical and bibliographic anomaly before the materials were sent out; that the camera operators, in the course of shooting some twelve thousand frames, never missed a page or skipped a target; that the exposure was absolutely correct for every image captured; that the water and electrical supplies were clear and uninterrupted; that the processor and all its pumps and chemistry were in top working condition; that the proper humidity levels in the printing room were scrupulously maintained; that the inspectors wore clean gloves the whole time they handled your film; that the inspection equipment was completely free of dust and dirt and grease and oil while your films were being reviewed; that the shipping clerk managed to get all your original volumes matched with all the right film; and that scores of other tasks were accomplished with absolutely no significant human error or mechanical failure or environmental disaster. That's putting a whole lot of faith in a whole lot of people and processes and machines and events over which you have no real control. I would argue that - even in those very few cases where it is well-placed - that kind of faith must nevertheless be tested and proved on a routine basis. And for those cases where the faith is most definitely ill-placed, the regular assessment of this film (film that is intended to last into the unforeseeable future) is practically an imperative.

Prior to establishing a quality assurance program, staff at the library and at the filming bureau must understand and agree on standardized means of measuring quality and of levying quality assessments. This means that library staff must be conversant in the basic technical aspects of preservation microfilming in order to communicate effectively about their needs. And that filming bureau staff must have a solid understanding of the formats and materials being
reformatted, and must have a grasp of what attributes the library values most highly. With this kind of mutual investment a bond is formed that can serve as the basis for a strong working relationship, one that facilitates the production of the desired high-quality end product. Curiously, although quality assessment relies on a variety of objective measures like film density, image resolution, and the presence or absence of defects, it is - in practice - more of an art than a science given its reliance on personal empirical judgements and comparisons.

TECHNICAL FILMING GUIDELINES

Our notions about quality derive from a definition of preservation microfilming that has evolved over the past decade and are now embodied in the RLG guidelines. We've outlined prefilming practices for both monographs and serials, established uniform methods of target creation and use, codified technical microfilming guidelines, and even formulated procedures for marking and labelling film containers. The majority of US libraries creating preservation microfilm now adhere to these guidelines and require that their filming agents do so as well. (This year we also launched a project¹ to develop parallel guidelines and procedures for the preparation and filming of archival and manuscript materials. A publication is now being written and should be available by late next year.)

The RLG guidelines for books and serials consist of specifications for and stipulations about:

* Contaminant-free workplace requirements
* Uniform density across the frame
* Identification of acceptable film stock, reels, fasteners and containers
* Residual thiosulphate testing: frequency and results
* Density reading throughout each reel (with itemized ranges of acceptability)
* Guidelines for determining reduction ratios
* Use and placement of resolution test targets
* Resolution requirements
* Inspections for defects
* Splices: types, frequency, and placement
* Framing, spacing, skew
* Length of leaders and trailers
* Multiple exposures: when and why
* Use of polysulfide treatment

Filming agents are required to record a fair bit of technical information as well as the results of these various quality measures on a standardized form that is returned along with the completed film to the owning library. The form functions as the benchmark against which the film is later inspected by library staff.

¹ The working title for this monograph is: *RLG Preservation Microfilming Manual for Archival Collections*. Chapters are now being written covering such topics as "Management Issues for Preservation Microfilming", "Selection Strategies", "Selecting a Vendor and Contracting Out", "Microfilming Unique Documents", "Quality Control", and others. Publication is anticipated in mid- to late-1993.
RECOMMENDED PROGRAM OF MICROFILM INSPECTION

In order to assist library staff in determining whether their filming agent actually fulfilled his or her contractual obligation, we developed a recommended program of microfilm inspection and included it in our Handbook. We suggest that staff who will be handling film should be trained to do so, that they have adequate space in which to perform these tasks and that they have at their disposal all necessary equipment and supplies, including:

* clean cotton gloves
* film rewinds mounted on a level working surface (3’ apart)
* light box
* jeweller’s loupé
* binocular microscope (100x magnification)
* transmission densitometer
* microfilm reader adapted to prevent damage of 2N and 3P film

The program separates inspection of each film generation and the original volume into three categories: general, technical and bibliographic. Within each of those categories, we identify the types of assessments that should be performed on each item. We also make suggestions as to how often inspections should be carried out.

MASTER NEGATIVE

**Frequency:** Recommended frequency ranges from full inspection of 10% of all master negatives produced to full inspection of 100% of all master negatives produced. What this means is that when you begin working with a new filmer or on a new project you should conduct a full assessment on the first three batches of first generation film you receive. If you find few significant quality problems in those shipments you can probably reduce your inspections to ten percent of all reels received. It is good sense, though, to reinstate 100% inspection when you change filming agents, until you reach a comfortable level of confidence in that new filmer’s work.

**General Inspection:** This is where we review the film base to make sure its really polyester and not acetate, where we check the emulsion to make certain it is silver gelatin, where we verify that the boxes and the button and string ties are of the sorts specified, and that all appropriate forms are present.

**Technical Inspection:** The technical inspection is a series of assessments to evaluate the technical merits of the film in relation to the guidelines you have in place. Using cotton gloves, mounted rewinds, a light box, a microscope, a densitometer, and a loupé, you:

* look for and note the presence of scratches and other defects;
* review all splices, noting the number, type and placement;
* calculate the resolution achieved for each title filmed based on an analysis of each technical target;
* assess the film density by conducting a series of readings using the densitometer.

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Scratching. Scratching is the single most cited defect in silver film. We see scratches on the leader and trailers, on the film edges, within the frame but not obscuring text, and we even sometimes see them cutting straight across areas of text or image. Scratches are a fact of life when dealing with silver gelatin emulsions; they happen easily and often unnoticeably. The hard thing about scratches is not finding them, it’s deciding what to do about them. The film inspector has to first figure out whether a scratch is on the base side or the emulsion side of the film. Next up is to determine the extent of scratching on the reel. (Was there just the one scratch or several? Was text obscured? Was emulsion obviously gouged out?) Finally, an attempt to analyze the source of the scratch must be made. The inspector is of course noting all these findings on a specialized inspection form to be used at the end of the process in making a final quality assessment on the film. Other defects to look for include skewed pages, objects in the frame, focus problems, frame spacing, water spots, and fog marks.

Splicing. The need to splice roll 35mm camera negative film is fairly common but we hold the line at a total of six for a 100-foot reel. Regardless of where you set your limit, the inspection should include a count of the number of splices, and assessment of the type of splicing technique used, and the location of each. Because of their permanence and stability, we allow only ultrasonic welds in our camera negatives and no splices at all in either the second or third generations. We also stipulate the distance one splice must be from the next and the number of frames to be repeated when splicing in a retake. Each splice should be reviewed to ensure that the guidelines and standards are met.

Resolution. Resolution is a measure of a photographic system’s ability to record fine detail. In order to achieve the highest possible resolution for the materials we’re filming using the equipment we have available, a system called the Quality Index was devised. With this system, we can calculate how many line pairs per millimeter should be resolvable in the first generation master negative if we know the height of the smallest letter “e” in the material being filmed. Conversely, the system is often used by camera operators to determine the appropriate reduction ratio to be used on each volume filmed. Resolution evaluation is done using a microscope to look at sets of lines printed on a special target that is filmed at the beginning of each title on a reel. Essentially, if you’ve got good resolution the text characters are nearly as sharp and clear on film as they were in the printed volume. The open spaces inside of lower case “e’s” are crisply white, the thins on serifed letters are clearly visible, and the space around and between words is white, not muddy gray. Given the kinds of optics and camera systems now being used for preservation microfilming – even modified vintage Kodak MRD’s - achieving these minimum required resolutions for most of the printed materials we film should not be terribly difficult.

Density. Density refers to the opacity of the film and is measured using a device called a densiometer. Density measurements are indications of contract between the dark and clear parts of the film. Our guidelines allow for quite a broad range of acceptability for density but each overlapping step in the range is keyed to particular levels of contrast in the original document. For instance, if your original consists of bold printed or bold handwritten text on crisp white paper, it falls into the category of high contrast and the background densities of the filmed images should be between 1.00 and 1.30. If your original is comprised of bold print or handwritten text on moderately darkened or coloured paper, or if the inks themselves are somewhat faded, it falls into the category of medium contrast and the background densities of the filmed images should be between 0.90 and 1.10. Finally, if your original contains faint inks or pencils on moderately or severely darkened paper or if the paper is either onion skin or some other tissue-like substance, it falls into the category of low contrast and the background densities should be between 0.80 and 1.00.
The striking thing about density for those of us who don't operate cameras or look at film for eight hours a day is how subtle the differences can be. Obviously, we can all look at two images at distant points on the density spectrum, one quite legible and the other quite illegible and easily discern the difference between a good image and a bad one. But if you were to look at a series of identical images, all falling within the acceptable range of density but each one with slightly higher density than the next, you'd begin to understand how heavily dependent quality assessment is on individual preferences based on aesthetic rather than scientific judgements.

PRINTING NEGATIVE

Frequency, General and Technical Inspection: Printing negatives should be assessed in the same way as a master negative, but with a couple of key differences in the technical guidelines.

* Density ranges for printing negatives are driven by the density values possible with particular films and in the context of what was achieved in the master negative from which this was produced. In general, it is much more useful and informative to monitor the Dmin (i.e., clear areas of the film) on printing negatives rather than the Dmax.

* No splices may be made in any but the camera negative - so a splice in the printing negative is automatic cause for rejection of the reel.

SERVICE COPY

Frequency, General and Technical Inspections: The library should plan to conduct technical and general inspections on at least ten percent of the service copies received. And, if numerous significant problems are discovered, it will be necessary to sustain full inspections on 100% of all reels received until problems are resolved. Like printing negatives, there are a few key differences in what we look for from the technical inspection compared to what we look for in the master negative.

* The ultimate criteria for quality in the service copy is not density readings; rather, the film should be legible with sufficient contrast for its intended use.

* No splices may be made in any but the camera negative - so a splice in the service copy is automatic cause for rejection of the reel.

* The leaders and trailers must be at least 500mm long so that they can adequately protect the imaged portion of the film as reels are loaded onto and off of film readers.

Bibliographic Inspection: The bibliographic inspection is the principle inspection performed on the service copy. Unlike the various technical assessments, it is fairly straightforward and uncomplicated. Further, it is most often conducted on the service copy and not the camera negative since it requires that the film be mounted on a film reader (which can damage film if not maintained properly). The intent in this inspection is to - first - determine whether or not all targets and pages were filmed and - second - whether or not they were filmed in their proper sequence and - third - whether the image quality is adequate for its intended use.
Our guidelines for ensuring "completeness" of the reformatted item are keyed to the format of the original materials. If you are filming printed materials you can opt to prepare them in one of two ways: either using a page-by-page collation strategy or by using something we call a thumb-through collation.

The first option, called page-by-page collation is most often exercised on materials that have received moderate to heavy use over time. Staff literally move through the volume page by page, verifying that all pages, leaves, plates foldouts, maps, and illustrations are present and that they can be filmed without correction or replacement. If this option is used at the preparation stage, the bibliographic inspection of the microfilm can be scaled down to something around a ten percent sampling of film to ensure that the camera operator filmed everything in its proper order.

The second option, thumb-through collation, can be exercised when the materials you're filming are uncomplicated items, little used over time, that are unlikely in your experience to be either missing pages or containing obscuring marks of any kind. Collation is merely a fanning of the pages of the volume to note obvious problems. If this option is used at the preparation stage, you have basically committed yourself to conduct a frame-by-frame evaluation of the completed film. That frame-by-frame assessment is then a substitute for the page-by-page collation. The inspector is looking for missing pages without necessarily knowing whether the camera operator made a mistake or if the volume lacked the page at the outset.

If archival collections are being filmed, we require that an item-by-item collation be performed prior to filming and that a frame-by-frame inspection of the film be performed on every reel of film produced, not just a percentage. One rationale for this requirement is pretty obvious: archival collections are most often comprised of a variety of materials ordered in ways that are meaningful to the archivist but not to the camera operator. As a consequence, it is very difficult to develop a rhythm at the camera comparable to turning pages of a volume. And, since that rhythm is so elusive, it means that errors and oversights occur with greater frequency. The more compelling rationale is that archival collections are almost always unique. We need to make doubly certain that all documents and letters and receipts that were in the collection actually end up on the film, since there is no other copy, no likelihood that it will be filmed by others elsewhere.

REGULAR EXAMINATION OF STORED CAMERA NEGATIVES

Quality assurance begins with what materials you select for reformating onto microfilm and continues throughout the inspection and refilming processes. It also includes informed decisionmaking about post-processing treatments such as polysulfide, to provide some additional protection for your film over the course of its useful life. But that's still not the end. After all this work, after an incredible investment at the local and national levels, it makes little sense to put the camera negative in a closet somewhere and forget about it. We need to agree on the value of permanent storage facilities for the maintenance of our growing libraries of masters. Those facilities must provide environments that are secure from fire, water, and theft; they must protect our film from gaseous and particulate pollutants; they must not only maintain appropriate temperature and humidity ranges but there must also be adequate monitoring systems in place to ensure against failures and changes. Finally, even after we've established such facilities and stored our films there, we're still not done. Our final task - and one that must be passed on to future generations - is to implement regular programs of examination and assessment so that defects or damage or deterioration can be
noted and corrected prior to losing entire collections. This precept is particularly important as we consider that film may well be only the first of many formats into which the information will be converted over the next millennium; indeed, if we digitize the content of master negatives, our obligations for continued maintenance become even more crucial.

INSPECTION PRACTICUM

Okay. You’ve listened to me talk about quality and about how we try to quantify it and qualify it. Now here’s the tough part; deciding what to do when you find a problem. Let’s assume we’re inspecting a reel of film. (We’re going to see a mixture of negatives and positives, but let’s pretend we’re looking at the master negative.) After each frame I’ll ask you to vote on whether the problem you see would be serious enough to cause you to reject the film and send it back for reshooting.

#1: Skew (sort of bad) What if lots of frames looked like this? Accept - or - Reject?

#2: Skew (really bad) What if lots of frames looked like this? Accept - or - Reject?

#3: Scratches (non-text) What if lots of frames looked like this? Accept - or - Reject?

#4: Scratches (in-text) What if lots of frames looked like this? What if only ONE frame looked like this? Accept - or - Reject?

#5: Gutter shadow What if lots of frames looked like this? (How many of you have seen this before?) Accept - or - Reject?

#6: Chopped-off image What if lots of frames looked like this? What if only ONE frame looked like this? Accept - or - Reject?

#7: Hand in frame What if only ONE frame looked like this? Would your decision be different if the hand partially covered text? Accept - or - Reject?

#8: Out of focus What if only ONE frame looked like this? What if several frames scattered throughout the reel looked like this? Accept - or - Reject?

#9: Light in frame What if only ONE frame looked like this? What if several frames in a row within a reel looked like this? Accept - or - Reject?
These last five slides illustrate the very real tension between consumers and producers of preservation microfilm and at the same time argue powerfully for greater knowledge and experience on both sides; in fact, the quality of the filmed image will always rest principally on the quality of the original. If you’re working with extremely darkened paper with faded print, your filmer is going to have a really tough time meeting standards. This is why the ultimate quality test in those cases is often legibility.

WHEN QUALITY IS IN DISPUTE

There are five basic steps to follow when disputing the quality of a preservation microfilm product:

**Recordkeeping:** A vital component of quality assurance is writing down the results of your assessments. The library’s inspection record, in combination with that information already received from the filming agents serves as the foundation for discussions about quality problems. This way, no one has to rely on someone else’s memory of an event nor do they have to depend entirely on subjective analyses. Think of this as a central piece of the communication fabric, and one which can actually serve the needs of both filmer and library.

**Identify and analyze the problem:** Next you need to identify the problem or anomaly and assess its scope. Is the problem limited to a few frames out of focus or out of alignment? Is it a series of defects and poor images throughout the reel? Would you characterize it as a minor, mid-level, or major defect?

**Identify possible causes:** Once you’ve identified the problem you should try to analyze its causes. Was it a straightforward situation where the camera operator shot the entire title at an inappropriate reduction ratio? Or was it perhaps the result of incomplete washing or rinsing in the processing cycle, leaving dried chemistry behind?
Options for corrective actions: Next you'll need to determine what your options are for corrective actions. Is it simply a matter of re-washing the reel to remove the residual chemistry? Or is the problem so invasive that you'll need to have the entire reel refilmed?

Negotiate an acceptable resolution: Finally, you and your contact at the filming bureau need to negotiate an acceptable resolution. Obviously, your contract must contain wording that identifies remedies in the event that contractual agreements are not met, but most libraries rarely have need of such clauses. For the most part, negotiation is a minimalist affair, with the filming agent accepting responsibility for and correcting problems that were the fault of bureau staff at no cost. Keep in mind that, if the defect is directly attributable to library error, the reverse is also true; the cost to correct it is charged to the owning institution, not to the filming agent.

There are a number of library concerns that inform this process and impact on what you decide is an acceptable resolution.

* **Condition of originals.** Will the volumes (or materials) survive refilming? What are the trade-offs between leaving the imperfect film as is and risking further damage to the original volume? If you are filming items having artifactual value, you may not wish for them to go back under the camera another time.

* **Aesthetic versus pragmatic.** Will refilming result in anything more than an aesthetic improvement? In other words, is the defect one that you and your researchers can live with even if it means that the film is not as good-looking as it could be? Conversely, is it something that either directly affects the long-term stability of the film or relates to the intellectual completeness of the information stored there?

* **Refilming is moot.** Sometimes a problem is discovered too late - the original volume has already been discarded. This is definitely an argument in favour of timely performance of inspections!

CONCLUSION

Over two hundred years ago, during a speech on negotiating with the American colonies, Edmund Burke made a statement that could just as easily be made today as we talk about the inherent challenges in preserving a portion of the written record:

...Every human benefit and enjoyment, every virtue and every prudent act - is founded on compromise and barter.

Preservation microfilm is, by its very nature, an imperfect product; our job is to make certain that it is not any more imperfect than it need be. From the moment we pull a volume off the shelf and decide to refomat it onto microfilm, each action we take to preserve it involves hard decisions. We sustain a balancing act between aesthetics and pragmatism and engage in a constant process of giving up one quality element in order to receive another; of holding firm on one line and compromising on another; of defining and redefining, of interpreting and reinterpreting our own standards and guidelines. Ultimately, we each develop our own personal and institutional recipes for deciding what is acceptable and what is not - recipes consisting of equal parts judgement, experience, technical skill, and confidence.
MICROFORMS FOR THE REMOTE USER: DSC, A NATIONAL RESOURCE

Janet Martin

This morning, Martin Flynn and Frank McCall have spoken of their experiences of serving the on-site user of microforms. However, not all microforms required by users are available on their home territory. Although it is often not regarded as such, microform is an ideal interlibrary loan medium.

Microform is easily packaged and transported worldwide using the normal postal service, all that needs to be assured for its sensible use is equipment and support at the receiving library.

The British Library Document Supply Centre (DSC) is already renowned throughout the world for its unrivalled holdings of scientific and technical serials, conference proceedings and millions of technical reports. The vast majority of the technical reports are held on microfilm or microfiche, all are available for loan to registered customers of DSC and this service is used by libraries throughout the world.

Along with the latest information on high-tech developments in the worlds of nuclear energy, space engineering and munitions we have documents among these technical reports which show history in the making, with, for example, details of the US Space Shuttle programme and Operation Desert Storm.

Recent history is well covered at DSC with 52 miles of 18th and 19th century American newspapers and periodicals on microfilm and 2965 reels of Presidential Papers covering 23 American presidencies.

Certainly, the riches of the historical microform collections at DSC are very little known, even amongst the staff of the British Library. Alongside the better known technical material is one of the largest collections of medieval manuscripts in Europe, annotated printer’s proofs and manuscripts by many literary and historical figures, photographs from the Royal Archives at Windsor Castle and, more plebian, the Tom Harrison Mass Observation Archive from 1937-1949, which gives a wonderful insight into our recent past.

From this latter archive we can find ‘A Note on People’s Feelings about Tinned and Dried Peas’ of April 1943, which finds a distinct preference for dried peas in Bolton and for tinned peas in London, ‘A Comparative Note Between Pantomime and Music Hall Reports’ from March 1940 and a report of October 1941 on a scheme to recycle razor blades.

Not all microforms are in black and white. The Victorian photographs are in sepia some with hand tinting and, as we have had on show during this conference many of the medieval manuscript collections include beautifully coloured frames.

The Microform Research Collection, from which all of the more historical examples of our holdings have been taken, is valued at £1m but, at present, it is attracting very little use. We believe that there are two reasons for this.

Firstly, it is not expected that the non-published element of this material is available for interlibrary loan and secondly much of the published material within the collection, other than the periodicals, is not adequately catalogued and is therefore lost to use.

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Who would dare to ask for the loan of the 12th Century manuscripts of St Gregory on the Book of Job, or if they did, what would be the reply they received? A specialist in the field of mediaeval manuscripts would be able to trace the original item to the Lincoln Cathedral Library Mediaeval Manuscripts Collection and from there to 2 of the 10 reels of coloured and 73 reels of black and white negative microfilm that were published by World Microfilms during 1977/78. This has been on display during this conference.

Specialist advice on such matters is clearly needed and it is highly unlikely that the request, in its original form, would ever be channelled through interlibrary loan to the DSC. After all, don’t we say we have no manuscripts and nothing pre-1801?

A great deal of material in this collection is ‘non-published’. Manuscripts, collections of papers and diaries by eminent figures such as Beatrice Webb, Elizabeth Fry, Charles Dickens and Thomas Hardy, State Papers of the English Civil War and Interregnum, the drawings of Robert and James Adam and the Victorian Photographic Collection are among them.

Scholars needing to use such material can do much preliminary work before needing to look at or handle the precious original material. Use of the microform copies may even obviate the necessity of using the original.

Here is excellent raw material to work with and, by obtaining it cheaply on interlibrary loan, it can be worked on in a known environment at a convenient time, with the support of known library staff, without the expense of travel and hotel accommodation.

The second reason for the low use of this collection is that much of the published material has not yet been adequately catalogued and indexed at DSC. We have always had a tradition of ensuring adequate listing of our periodicals holdings and this has also been done with the majority of the periodicals in the Microform Research Collection, ensuring that this is where the bulk of the use of this collection is concentrated.

Monographs have not fared as well, however. For example, the Western Americana collection comprises 6096 individual items on the settling of the American West. It includes volumes such as:

The Life & Adventures of Nat Love Better Known in the cattle country as "Deadwood Dick" - 1907
‘Wife No.19 or A life in Bondage being an expose of Mormonism ...’ by Ann Eliza Young - 1896 ...
"The Snake Dance of the Moquis of Arizona ..." by John G Bourke.

At present little of this material is individually catalogued, so any individual items from this collection which are requested from us on interlibrary loan are unlikely to be traced.

When this material was purchased, it was expected that the collection would be requested in their entirety but, if this did happen 10-14 years ago, it certainly is not happening today.

We are trying to tackle both of these problems, the former by producing full lists of DSC holdings within this special collection. The list will be, in part, a successor to "Microform Research Collections at The British Library", which was published in 1988 and included items from other BL collections. We are hoping to have fuller entries, possibly in the style
of the "Microform Research Collections" brochure which is enclosed in your delegate pack and would welcome any comments or suggestions on this.

Investigations into the cataloguing of single, published items within our microform collections are starting with the possibility of obtaining records from the Online Computer Library Center (OCLC). This would have the added advantage of our holdings being further publicised on the OCLC database. However, as with any cataloguing project, there is a cost attached and lack of funds may greatly slow down the speed with which comprehensive cataloguing can be achieved.

I have spoken at some length on our less well known microform material, but would like also to draw your attention to our vast collections of British, American and Canadian doctoral theses on film and fiche.

The majority of British universities and, in the past, the CNAA, have supplied DSC with copies of doctoral theses for filming, both to help create a national archive and to have the results of publicly funded research available for the use of the wider community. It also lifted the considerable burden of responding to interlibrary loan demand from the universities and polytechnics. We are presently negotiating with the awarding bodies to update our old agreements and put in place a structure which will, for the first time, enable royalty payments to be made to the authors of the theses.

At present, we have around 100,000 British doctoral theses in stock, all of which are well catalogued and relatively easy to find. Full details of our monthly intake of this material is listed in, British Reports, Translations and Theses (BRTT) and details of all theses received since 1980 are available on the System for Information and Grey Literature in Europe (SIGLE) database accessible online through BLAISE and STN International and the SIGLE CD-ROM, which has just been released by SilverPlatter.

We have a much larger collection of US doctoral theses, almost 450,000. At one point DSC purchased the total UMI output of doctoral theses but since 1979 we have only purchased on demand to ensure that all the theses we obtain will be used. Again, this material is very well catalogued and items requested are easily traced. Unfortunately, our agreement with UMI precludes the loan of this material outside the United Kingdom, so we are unable to make as much use of this expensive asset as we would like.

Our largest microform collection is of technical reports issued by research and documentation institutes around the world, the main source of supply being the United States. We hold well over 3½ million reports issued by NTIS, NASA, AIAA, ERIC, INIS, ASI, CIS, etc. This is a unique collection, both from its size and scope and as the only such collection in the world which is solely dedicated to interlibrary lending. It is particularly strong in the areas of education, defence, energy, aerospace and the environment.

Again, this material is well catalogued but it can sometimes appear to be too well catalogued! Many of the reports have 2, 3 or even 4 secondary report numbers. If you ever need to request such material, please quote everything in sight - it is not easy to ascertain which is the 'correct' number.

To help ourselves in this area we have for several years produced ARPI - the Alphanumeric Reports Publications Index, which is a unique finding tool. Last year we updated and
expanded ARPI and made it available for sale to users of the DSC, from whom there has been a very enthusiastic response.

Even within this section of the microform collection there are still many surprises - who would expect the monograph by R G Thomas et al. "The Golden Hamster: Quantitative Anatomy with Age" to be published by the Los Alamos Scientific Laboratory as part of the US Atomic Energy Programme? Despite the excellent catalogues and indexes we have, without the magic "LASL-79-58", we probably could not trace this item as we would expect to find it within our normal monograph collection. This document does not conform to the high quality standards we heard about yesterday - the fiche has the disclaimer "portions of this document are illegible". The remainder of the microform material at DSC consists of some fairly short runs of heavily used newspapers plus 'The Times' from 1960 onwards and odd issues, years or volumes of periodicals which we have been unable to obtain in hard copy. This part of the collection is well catalogued on our Serials File and is quite well used.

The most recent additions to our Microform Research Collection are 2 reels of microfilm very generously deposited with us on permanent loan by the Huntington Library in California. Once again, this is non-published material and comprise the complete set of photographs of the Dead Sea Scrolls. These will prove invaluable to the many scholars researching in this field and the films have been deposited with the Document Supply Centre to ensure worldwide availability through interlibrary loan.

Thus the microform holdings of the British Library Document Supply Centre span 2,000 years and all are available for loan.
THE DIGITIZATION OF LIBRARY MATERIAL

by Roger Broadhurst

Editorial note: It was not possible to reproduce the talk given by Tony Hendley at the conference. Because of the keen interest in the subject, we have included this article by Roger Broadhurst of Cimtech Limited on digitization in its place. The article was originally published in Library & Information Briefings, Issue 39, February 1993.

BACKGROUND

A number of studies of the ways in which scholars and researchers work to create and disseminate knowledge have shown that productivity depends on the ready and timely access to relevant information. These studies also suggest that scholars and researchers highly value and tend to favour information that is readily available. While this might seem to be stating an obvious truth, it emphasizes the fact that the accessibility of information is a critical factor in its use and a direct measure of its value. Or put another way: the more accessible it is, the more useful it will be.

Libraries often face a difficult task in balancing the need to hold and preserve information, most of which is in printed form, with the need to make that information readily accessible to researchers and scholars. The difficulty is highlighted in the case of rare or fragile books requiring such a high level of care and protection that it is often impracticable for users to be allowed direct access to them.

Despite the difficulties associated with access to the various forms of paper-based information we have all become very familiar with the medium and appreciate its qualities. There is no reason to doubt that as long as we can get our hands on paper we will feel comfortable using it and happy to go on using it.

At the same time, we are becoming increasingly familiar with electronic information and the advantages which this has to offer. We only have to look at the CD-ROM success story to appreciate the benefits to users of providing near-instant access to vast quantities of data, albeit data which, in the main, have been originated in electronic form.

This leads us to ask whether it is feasible to convert paper or film based library information to an electronic form suitable for use in computer systems. Thanks to developments in image processing technology and high density optical storage media, the widespread use of powerful desktop computers and high-speed networks, the answer to the question is a definite "yes".

With such systems now increasingly common for document management applications in business and industry, the way is open for applications in the library and information world. There are some distinct differences between the needs of library and business users and between the types of material being handled, all of which call for careful consideration. However, a number of libraries are already considering experimental or pilot systems and are beginning to understand how it all fits together. It is a challenging task and not without its difficulties, but nevertheless one that should bring rich rewards.
RESEARCH

There is currently very little experience in the UK of digitizing the various types of library material and of the role which this will play in future preservation programmes. This is one of the reasons why the British Library Research and Development Department recently funded Cirntech Limited to undertake an eighteen month project designed to investigate the feasibility of the process in connection with both printed material and microfilm and to establish a demonstration facility for interested parties. This project was completed in August 1992 and the findings presented in a report to the British Library. Much of the information in this article is based on the findings of this research project.

A number of academic and research libraries in the United States are also known to be undertaking significant research projects which will add greatly to the present level of knowledge and experience of digitizing library material. Once of these projects is being undertaken at Yale University and focuses on the volume conversion of 35mm microfilm. With microfilm being used extensively as a preservation medium for "brittle-books" there is particular interest in digitization for improving access to this material. The provision of improved access to information is an underlying theme of many of these projects.

THE DIGITIZATION PROCESS

In the present context, digitization is the process of converting a printed page to digital electronic form suitable for computer storage, transmission and retrieval. The information on the page is captured by a document scanner which generates an electronic image by analyzing the page in a series of closely-spaced lines (scan lines), typically 200 or 300 per inch. Each line is analyzed at points along its length corresponding to the scan line frequency, ie 200 or 300 points per inch typically. The process effectively divides the page into a very fine grid comprising many thousands of tiny picture elements (pixels).

Document scanners operate either by moving an optical assembly past the stationary document, placed face down on a glass platen, or by transporting the document past a fixed optical assembly. Some scanners can operate in both modes while others are limited to a single mode. The optical assembly includes a lamp, to illuminate the full width of the document, a lens and one or more mirrors.

During the scanning process the lens images each successive scan line on to a device known as a linear CCD array which comprises a row of very tiny light sensitive cells. When light reflected from the document falls on one of these cells, an electrical voltage is generated in proportion to the intensity of the light. The output from the scanner is a series of voltages corresponding to the variations in the brightness of the page along each scan line and from one line to the next. The brightness of the page is determined by the presence or absence of print on the paper.

A thresholding system is used to convert these voltages to computer "ones" and "zeros" depending on whether they are above or below the threshold value. The result is a black and white image in which all parts of the page below the threshold brightness appear black and those above the threshold appear white. This electronic "image" is referred to as a raster or bit-map image.

The series of ones and zeros that make up the image are then passed to the computer where they can be stored as a normal file. However, the size of these files is very large and so it
is normal to use compression techniques (typically CCITT Group IV, as used in fax machines) to reduce their size and so make best use of the available storage. Without compression, the image of an A4 page scanned at 300 pixels per inch is over 1MByte. Compression can typically reduce file sizes by around twenty times, although the precise amount is variable and determined by the amount of information on the page. The more information, the less the image can be compressed.

The digital image can be displayed on a monitor immediately after the page has been scanned. If the image is judged to be of poor quality for any reason it can be discarded and the page re-scanned using different scanner settings. A high resolution display is required for effective quality control of images. The final image or images then need to be indexed in a database to allow subsequent retrieval. After they have been indexed the images can be transferred to a high capacity storage medium such as an optical disk. For library applications involving complex multi-page documents, considerable thought needs to be given to the indexing method. Failure at this point could make searching and retrieval of information very much more difficult.

Scanners

Document scanners work at different speeds. Low volume scanners may take between 15 and 30 seconds to scan an A4 page, whereas faster machines can scan a page in approximately two seconds. For very high volume applications much faster scanners are available. The lower volume scanners typically cost between £1,000 and £5,000.

Microfilm requires a special type of scanner. These work in essentially the same way as document scanners but use an optical system based on transmitted light and which is able to take account of reduction factor used to produce the microfilm image. Microfilm scanners, like microfilm readers and reader-printers, incorporate a film transport mechanism appropriate to the type of microform being scanned. Some scanners are available with interchangeable film transports to allow a variety of film formats to be accommodated. The output from film scanners is in the same form as that from a document scanner and is treated in exactly the same way by the image processing function of the computer.

Microfilm scanners are very much more expensive and there are only a few models available. Most are production machines costing around £50,000. The Mekel M400XL and the Sunrise DMS50i are the two best known microfilm digitizers in the UK at present. Scanning speeds are roughly comparable to low volume document scanners although they vary widely depending on the type of material being scanned.

For low volume film digitizing it is possible to use one of a number of digital reader-printers that are now available from companies like Canon, Bell & Howell and Agfa. These are essentially retrieval and viewing devices for microfilm that use digital image technology to produce enlarged paper prints. By allowing access to the digital image generated by the scanner they can be used as input to other systems.

DIGITIZING PRINTED LIBRARY MATERIAL

Printed library material can present a number of difficulties for scanning. The main problem is that most document scanners have been designed to meet the needs of business applications where documents tend to fall within a limited range of sizes and are often single sheets that allow automated handling. Library applications are much more demanding and the majority
of scanners are simply not flexible enough to cope with the wide range of material that is likely to be encountered, e.g. books, other bound volumes, oversize items and material in poor physical condition. Few document scanners will accommodate material larger than A3 size.

Books can be particularly difficult to handle. Even if they can be opened flat without damaging them, it is usually very difficult to position the page accurately and to hold it still during the scanning process. This is a serious limitation which means, at best, that scanning is a very slow and laborious operation and, at worst, that it is precluded altogether. The problem can only be overcome by removing the spine and reducing the book to single sheets. This might be an option with books that are already deteriorating but in most cases it will not.

At least one company, Xerox Information Systems, produces a scanner that goes some way to overcoming the difficulty of scanning books. This device has a glass platen very close to one edge of the unit and accommodates open books by allowing the page that is not being scanned to overhang the edge of the scanner. This means it is unnecessary to open the book flat, an advantage if the binding is tight, although the operator might still need to hold the book in place throughout the scanning operation. It also means that alternate pages are presented to the scanner upside down and so the scanning software must be able to rotate these images after scanning.

In many respects handling books for scanning is much the same as for photocopying. It can be done with difficulty in most cases although the end results may not be very satisfactory. There is a clear need for a scanner designed especially for books and bound material and until such a product emerges the situation is unlikely to improve very much.

Handling photographs and colour

The majority of business imaging applications require that document images be captured in black and white only. Even if the text is printed in coloured ink or the paper has a colour tint a simple black and white image is all that is needed. This is also the case with a lot of library material, e.g. books and newspapers, where black on white print is the norm. Line art illustrations can also be captured perfectly well in black and white. However, a lot of printed library material also includes photographs in either black and white or colour.

The result of scanning black and white or colour photographs is the loss of all intermediate grey or coloured tones, i.e. similar to the results obtained using a photocopier. To capture intermediate tones in the digital image most black and white scanners can perform what is known as a dithering technique. This is really an electronic half toning process which produces black and white dots in varying sizes to simulate shades of grey. This is a very useful feature although it usually results in larger image file sizes.

While it is technically possible to capture digital images in colour it tends to be done only in specialized applications where it is essential. Colour scanning is very much more expensive than black and white and results in significantly larger file sizes.

DIGITIZING MICROFILM

To date, most of the experience of digitizing microfilm has been gained with aperture cards. These contain a single frame of 35mm film mounted in a computer (Holerith) card and are widely used in industry for technical drawings, maps and plans. Aperture card scanners have been available for quite some time and a number of bureaux offer aperture card scanning as
a service. There is currently a lot of interest in digitizing aperture cards for use in electronic document management systems especially in the oil and gas and construction industries.

Unfortunately, aperture cards are rarely used in libraries and so there is no possibility of using aperture card scanners. The most common format by far is 35mm roll film and many academic and research libraries hold large collections. It is only in recent years that roll film scanners suitable for the volume conversion of 35mm (and 16mm) roll film have become available and, even now, the choice is limited to just two or three machines. To date only a very small number of roll film scanners have been sold in the UK and virtually all of these have been bought by service bureaux.

Much of the present requirement for roll film scanning is from commercial organizations rather than libraries. These typically include insurance and pharmaceutical companies which are installing document image processing systems and need to convert a backfile of documents, some or all of which are held on roll film. The limited availability of roll film scanners and their high cost (typically around £50,000) mean that film digitization is an expensive process. Only when the demand grows significantly and when service companies gain more experience are costs likely to come down significantly. However, things do seem to be moving in the right direction and we learnt only recently that the British Library has purchased a microfilm scanning system for evaluation.

In some respects microfilm digitization is more straightforward than document digitization as the operator is not involved with handling the original material. The physical aspect of the process will have been dealt with at the microfilming stage. Nevertheless, the digitization process can present a number of difficulties which the operator must be aware of and know how to cope with. As noted earlier, there is very little experience of digitizing library microfilm and the current scanners/digitizers should be regarded as first generation products.

THE PROBLEMS OF DIGITIZING LIBRARY MICROFILM

The work carried out by Cimtech and other organizations has shown that it is possible to capture high quality digital images from 35mm roll microfilm. In some cases the results can be indistinguishable from those obtained by scanning the original material on a document scanner and, equally important, can be achieved more easily in some cases.

Digital image quality is largely determined by the quality of the film itself. While it is possible to achieve satisfactory results from film images which differ quite widely, it is generally true that the better the film the easier it will be to achieve a good digital image. Unfortunately, library microfilm can vary considerably in its quality and it is not just variations from one roll to the next which can present difficulties. Variations from frame to frame within a roll are just as much a problem. While one can understand the reasons for these variations, they conflict with the capabilities of present film digitizers which, above all, require consistency from one frame to the next to achieve realistic levels of throughput. There is very little can be done to overcome this problem other than adjusting the digitizer manually to compensate for each change in film image quality.

When embarking on a film digitization project it is important to understand the different ways in which film image quality can vary and what effect these variations can have on the results. Much of the work undertaken by Cimtech was with samples of library 35mm roll film which could generally be described as poor from the point of view of scanning, ie the image quality was in some way less than ideal. Poor quality in this context includes a range of
imperfections due either to the condition of the original material, e.g. damaged or stained pages, or to poor microfilming technique. Whatever the reason it is sound advice to conduct some scanning trials at an early stage with representative film samples to determine what level of quality can be achieved and at what cost.

A visual check of the film, either by eye or with the help of a microfilm reader, will usually give a good indication of whether it can be scanned satisfactorily. One has to take into account the fact that the human eye is very tolerant and might not register certain imperfections that show up at the scanning stage, e.g. a small change in image density across a frame of film, although many imperfections are obvious enough.

An ideal film is one in which the images are of consistently high photographic quality, i.e. good contrast and resolution, and are located squarely and centrally within the frame. This allows the scanner parameters to be set for the first frame on the roll and all subsequent frames to be scanned without further adjustment. Poor film is characterized by low photographic quality, i.e.

- poor contrast and resolution
- skewed images
- inconsistent placement of the image within the frame
- "show-through" of print from the reverse side of the page
- shadows and image distortion caused by the pages of the book or document not being held flat during filming.

Poor contrast

There is very little that can be done at the scanning stage to compensate for film images which are of a poor contrast, other than making critical adjustment to the scanner exposure setting. If the film contrast is particularly low then it will be very difficult for the scanner to distinguish between the image and the background. Given an image of moderate contrast, however, satisfactory results can usually be achieved as long as there is not an excessive variation in density across the frame and the scanner exposure level is set to the optimum value.

Skewed images

Skewed images can sometimes be corrected if the scanner incorporates an automatic deskewing facility. This is an image processing function which is able to detect the amount of skew present in the film image and to rotate the digital image back to the vertical i.e. there is no skew present when the image is displayed on the monitor. While this can be a very useful facility it should be used with some care as success cannot be guaranteed and there is usually a limit to the amount of skew that can be dealt with. Another drawback is reduced throughput due to the increased processing overhead.
Inconsistent placement

Variation in the position of the page image from frame to frame is one of the most difficult problems for scanners to cope with. For the scanner to operate in automatic mode the operator needs to define the precise area within the frame which contains the image of the page. If the page image falls in the same position within each frame then the setting for the first frame will apply to all successive frames. If the page image falls in a different position from one frame to the next then it will be necessary to define a larger scan area and to accept unwanted parts of the film frame in the digital image. Alternatively, the scan area will have to be defined for each frame in turn. This precludes automatic operation and reduces throughput.

Double spreads

Another potential difficulty presents itself in the case of books which have been filmed as a double page spread, i.e. two pages appearing within each film frame. To capture the pages as two separate digital images, as might be necessary for indexing purposes in some applications, it will almost certainly be necessary to operate the scanner in manual mode and to define two scan areas within each frame. At present there seems to be no simple way of separating the frames automatically, although future scanners might include this capability.

A specialized operation

Describing many of the difficulties in this way could give the impression that digitizing microfilm is more trouble than it is worth. It certainly has its fair share of problems and people need to recognize that it is a specialized and, as yet, a costly operation. However, there is every reason to believe that the situation will improve as the next generation of more intelligent hardware comes along.

It should be borne in mind that virtually all library microfilm was produced before digitization was envisaged and, therefore, before the specific requirements of the process were known. As experience of film digitization increases it is important that the lessons learned should be considered when revising microfilming standards so that new microfilm will facilitate easier digitization.

OPTICAL CHARACTER RECOGNITION (OCR)

The value of the textual information on a printed page can be greatly increased if it is converted to a computer processable form. This can be done in two ways, either by rekeying it and entering it into a word processing application, or by using optical character recognition (OCR).

OCR is a technology that has advanced considerably in recent years and is used in a growing range of applications. It operates by analyzing a raster image of the page captured on a scanner and recognizing the shape of the individual text characters. It then converts these into ASCII format to produce editable text equivalent to that produced by direct keying. It is, of course, not quite as simple as that. Accuracy of the result depends on many things and even the best OCR system cannot claim to be perfect. (See also LIB 16, Optical Character Recognition, by Caroline Moore).
Its relevance to the digitization of library material lies in the fact that one is producing a raster image of each page, whether from the printed page or a microfilm copy of it, as part of the digitizing process and so there is a ready-made opportunity to apply OCR for the conversion of the text to an editable form. Not everyone will need to do this, but one can envisage situations where it is extremely beneficial, e.g. to facilitate full-text searching of the contents of a document. The recognition process does not have to be carried out at the time of scanning. It can be performed at any later time as long as the raster image of the page exists.

As is so often the case, the practice differs from the theory. It has to be said that OCR, despite recent advances, operates most successfully under controlled conditions. High degrees of accuracy can be achieved if the printed text is of good quality in every respect and the page formatting is uncomplicated. Anything less than this is liable to result in some errors. The question to be answered is how many errors can be tolerated and how much effort will be needed to correct them.

Attempts at Cimtech to apply intelligent character recognition (ICR is an advanced form of OCR) to raster images from library microfilm achieved only limited success. This is perhaps not surprising in view of the nature of the material used for the tests, most of which was of an historical nature and not particularly good quality, but it served to demonstrate the very significant overhead that can be involved in verifying and correcting the results. It also highlighted the need to achieve the highest possible quality raster image, especially if OCR is to be applied at a later date.

The varied nature of library material causes us to conclude that while the application of OCR/ICR is likely to increase, it will be a long time before it can be applied routinely to all material.

CONCLUSIONS

There is every reason to believe that an increasing amount of library material (originals or microfilm copies) will be converted to digital form and that, in the long term, it will become just another means of improving access and adding value to recorded knowledge.

At the moment we are at an early stage in the development of the specific hardware and systems needed to realize the potential of digital imagery in libraries. The varied nature of library material poses some special problems for the current generation of document and film scanners making digitization a time-consuming and expensive operation which is unlikely to attract customers at a time of economic recession.

However, technological developments can be expected to overcome, or at least alleviate, many of the present constraints while increased user awareness of electronic information systems will foster demand for imaging systems. The outlook is very promising although the time scale is difficult to predict.
MICROFORMS: STILL THE BEST HOPE FOR PRESERVATION?

Peter Fox

In this final session of the conference, I shall try to draw together some of the themes which have arisen over the last two days, avoiding as far as possible a repetition of what has already been said, but where I do cover the same ground I do so without apology, because I think that some of the issues need to be reinforced and considered from perhaps a slightly different angle.

In this conference we have heard much about planning a preservation microfilming programme, ensuring that the best quality is achieved, serving the needs of users, and so on. The topic which I have been asked to address is the question: Is microform still our best hope?

In order to answer this I must begin by adding a supplementary question: our best hope for what?

Clearly, if we are talking about preserving the Book of Kells or the Domesday Book, then microfilming it and dumping the original probably is not an approach that would be widely welcomed. Similarly, microform would not generally be regarded as an alternative to preserving in the original a private press book with a fine binding.

Before we can begin to answer the question, therefore, we have to consider the material in question. Then we must assess what other techniques are available and compare their advantages and disadvantages to those of microform. And, since the title which I have been given includes the word ‘hope’, I feel justified in allowing myself a little crystal-ball-gazing, in that I shall consider not just the techniques which are in use today but also some which might become available by, say, the end of the century.

An essential starting point in assessing the appropriate preservation technique is the material itself. There are several approaches to this which are covered in the literature; a useful one is that described by Clements. Using a matrix format, he considers the value of an item and the level of use to which it may be expected to be put. On the basis of this information, three principal courses of action are identified: leaving the item in its original format and carrying out appropriate conservation, producing a surrogate in a different format, or doing nothing.

I want to look briefly at each of these in turn. First, leaving the item in its original format and carrying out appropriate conservation. Well, what is appropriate conservation? This is something which should be determined jointly by the librarian or curator in conjunction with the conservator. Hand conservation is a technique which can be justified only for items which are either in high demand or where they are physically of intrinsic value, and so it is not a solution to the problem of brittle books on a large scale, which is essentially the issue which concerns this conference. It was about twenty years ago when one became aware of signs of increasing panic in libraries in the United States as librarians came to realize the size of the brittle books problem. Various statistics were produced to boggle the mind. The alarm spread to Europe, but, for a number of reasons, the problem here is fortunately not on quite such an apocalyptic scale. First of all libraries, in north-west Europe at least, benefit from a more equable climate than those in North America. Secondly their stack areas have
tended to be less generously heated. Thirdly the great research libraries of North America
grew mainly during the nineteenth century, precisely at the time when publishers were
changing from rag to wood pulp paper, and so the collections which they were accumulating
were composed very largely of books and journals on acid paper which - unknown to them
at the time of course - was to prove to be the time bomb which they are now desperately
trying to defuse. It is as a result of these factors that Yale University can produce the
staggering estimate that about 80% of its collection is either currently or potentially brittle.2

Although the situation may at present be slightly less critical here, it is nevertheless a
problem which we have to face up to, and there is plenty of documentation showing the scale
of the problem in Europe. A few years ago the British Library reported that, of the eleven
million volumes published since 1850 which it had in its collection, surveys showed that
about 15% of them had paper which was so brittle that it required treatment.3 The 15% figure quoted by the British Library seems to be similar to that found in surveys done in some
of the other major research libraries in the British Isles, and so it must be assumed that it
represents an approximate order of magnitude of the brittle paper problem in any of our
major research collections.

It is against this background that I want to examine the options that are either open to us now
for the treatment of brittle paper or likely to become available over the next decade or so.
Ruling out hand conservation on cost grounds, there are essentially four options: mass
deacidification, paper strengthening, microfilming, and digitization. The first two leave the
item in its original form, the second two are surrogates which ignore the form of the original.

There are at present no mass preservation techniques available in the British Isles, although
mass deacidification has been in use, in North America particularly, for a number of years.
Mass deacidification involves the bulk treatment of large quantities of books with either a
liquid or a gas which reduces the acidity of the paper and stabilizes it. This process will not
reverse the deterioration, but if the books are still in usable condition they will remain so.
It cannot be used for books which have already become so brittle that the pages cannot be
turned without them fragmenting - a problem which many libraries, especially in the United
States, are already facing. There are several processes: the Library of Congress uses the gas
diethyl-zinc and the National Library of Canada employs a liquid-based process. A number
of other countries are conducting research into alternative techniques.

Although mass deacidification had been in use for a number of years, it does have
disadvantages. First of all, as has already been indicated, it is only feasible for use on paper
which is not so degraded as to be already brittle. Secondly, in order to benefit from the low
costs of mass processing, mass deacidification plants must be large, and therefore expensive,
and they require a constant feeding of books. Thirdly, questions are still being raised about
the long-term effect of the process. The Commission on Preservation and Access in the
United States has recently drawn attention to the fact that mass deacidification may not be the
panacea for all types of potentially brittle library materials that some scientists would have
us believe. In a research review published in December 1991 they pointed out that 'large
diversified collections contain a broad range of paper types from different time periods and
from all the corners of the world. Research tells us that the aging behaviour of these papers
will be different... As a result, deacidification of a diverse collection will probably not
impair uniform stability and similar extended lifetimes to all grades of paper represented in
that collection'.4
In order to try and overcome some of the disadvantages of mass deacidification, the British Library has adopted a different approach and has been searching for a bulk deacidification and paper-strengthening process which could mass treat books printed on acidic and brittle paper - in other words a process which would not only deacidify but also strengthen the paper. Since 1980 the Department of Chemistry at the University of Surrey has been carrying out experiments, and a successful result has been obtained in the laboratory. Accelerated aging tests have been carried out on the treated paper and these indicate a clear increase in strength. The only apparent difference between the treated and untreated books, apart from the increased paper strength, is an increase in weight, and the British Library has specified that this must not exceed 20% of the original weight. Funding and a commitment by other libraries for an operational process is now being sought. Although the laboratory results appear promising, there are still a number of questions about the long term effects of the process which have to be answered.

This paper-strengthening process shares with mass deacidification the requirement that, in order to maximize the benefit of the mass techniques, large numbers of documents have to be treated at a time and new material has to be constantly supplied to keep the plant running. So, although the unit costs may be relatively small (a figure of around £10 a volume is being quoted), the throughput demands a commitment from libraries which may be difficult to make given the current limitations on funding. Furthermore, the processing costs may be low, but the cost of setting up a plant is such that a country the size of the United Kingdom could justify having only one. This means that libraries will be involved not only in selecting material suitable for mass treatment but also in packing and arranging transport, with all the record keeping and so on, and thus additional cost, which this would entail. The possibility of retaining the book in its original form is an attractive one to librarians, but it clearly cannot be realized without considerable cost.

Let me now move on to the alternative, that of producing a surrogate of the original in a different format. Obviously format conversion means that all the physical elements of the original are lost, and it precludes any further study of typography, watermarks, binding or ink. It would not, therefore, be suitable for items of intrinsic bibliographic importance. But then most of the books and journals which are likely to pose a problem of brittle paper are not in themselves important from a bibliographic point of view.

The most widely used medium at present is of course microfilm, which has become the medium of choice for preserving deteriorating library materials. The technology has by now been well proven and is unlikely to change significantly in the future, the costs are predictable, and the archival qualities of correctly prepared and stored silver-gelatin microfilm have been established. The Mellon Microfilming Project has demonstrated that a preservation microfilming unit can be established in any library, and there is no need for a large central facility as there is for mass deacidification or paper strengthening, with the resultant savings in transport costs, etc. Once a master microfilm has been made, duplicate copies are easy and cheap to produce, whereas, with mass deacidification or paper strengthening, when you have treated one copy of a book you are left with the same thing - one copy of a book. A technique which can cheaply produce multiple copies from one processing operation must be viewed very positively. The Commission on Preservation and Access noted: 'For the solution which it provides to the "brittle books" problem now plaguing all repositories of material printed on acidic paper, microfilm is essentially risk free'.

So why look further?
As has been indicated already at this conference, there are disadvantages associated with microfilm. Despite the fact that it has been in use for years, readers still do not like it. It is impossible to scan quickly forwards and backwards and insert markers. It is impossible to compare two items at the same time. Readers, not to mention library staff, find the hardware fiddly and difficult to use.

In the United States, both Yale and Cornell universities are carrying out research projects on the use of digital imagery as a preservation technique, and in Britain Cimtech is working in association with the British Library on the possibilities of digitization. Compared to microform, digitization promises to offer much greater accessibility. Provided that the document is suitably indexed, it can be searched and browsed more efficiently than a document on microfilm. The output is likely to be of significantly higher quality. It may well soon be possible to add supplementary information to bibliographic records, such as tables of contents or enhanced subject information. Yale is carrying out studies to see whether this bibliographic information can be linked electronically to the digital images of the document to which it refers, so that sophisticated searching could be carried out on the digitized document. Unlike library microform readers, for which the market is small, the technology for digitized images is relatively standard and used for other purposes, so it will probably be relatively cheap and user-friendly. Digitization, therefore, appears to offer the prospect of overcoming many of the drawbacks of microfilm - at least as far as access is concerned.

The main concern about digital imagery is its longevity, or rather, the lack of it. Microfilm, if stored properly, will last in excess of a hundred years. The manufacturers of CD-ROMs claim that the disks will last twenty-five years or more. But even if they lasted a hundred years, that is not the point. The hardware certainly will not be available for anything like as long. Readers for those punched computer cards that we all used in the 1960s are now virtually unfindable, and institutions are already having difficulties reading magnetic tape created twenty years ago.

Digital storage could only be regarded as a preservation option if a library were prepared to build in the cost of ‘refreshing’ the data on a regular basis as the technology became obsolete. And I doubt if many of us would be willing to commit ourselves to this at present.

Digitization, therefore, has many attractions, all of them potential at present, but they will probably have to be realized in conjunction with microfilm. It is noteworthy that the Yale study mentioned above, with all its futuristic notions of digital access to documents, came to the same conclusion, that microfilm will continue to be the preferred medium for long-term preservation, but that digital images will become more widely used to provide access to documents. It may be that the digitized image will be taken from the microfilm or that the document will first be digitized and then the preservation microfilm created from the digital image.

I think it is fair to say, therefore, that, at the moment, microfilm is our best hope. It is possible that, in the future, it will be used in combination with other techniques, or that the mass processes of deacidification or paper strengthening will become attractive alternatives, but it is unlikely that microfilm will be superseded as the preferred preservation medium for many years, if ever.

In conclusion, I want to return to the question of the scale of the brittle paper problem.
Those of us who have conservation laboratories in our libraries have been lulled into a false sense of security, because we have been inclined to take the view that we are gradually catching up on the decay of the past and that eventually all of our collections will be restored to, if not pristine condition, then at least a usable condition. The awful truth is really only now sinking in that not only are we not catching up, but that, even with additional resources at a level at present undreamed of, we shall never be in a position where we can ensure the preservation of all those items in our library which we wish to preserve. It is not so much a question of preserving an item now or later. It is a question of preserving it or not. And it may have to be not. We are being forced into taking difficult decisions and selecting, in effect, those items which we are prepared to allow to deteriorate and which we shall eventually discard.

It has been reported at this conference that the National Library of Scotland has about one million volumes which are brittle or approaching a brittle state. A figure of £30 per volume has also been quoted as the average cost of preservation microfilming. This means that the National Library of Scotland alone has £30 million worth of work outstanding. If the figures for the number of brittle books in all the major research libraries in these islands are correct (and nobody has challenged them as far as I am aware), to preserve them would require an enormous sum of money, and one that is unlikely to become available to us. The only way, therefore, to attempt to ensure the preservation of our printed heritage is by co-operative action.

There is a need for libraries, both individually and co-operatively, to develop a preservation policy which will aim to ensure that the inevitable deterioration of a large number of books is a planned deterioration, and, distasteful though the concept may be, it is inevitable unless somebody can produce a miracle cure. This can only be achieved on a national or international basis through schemes such as the Mellon Microfilming Project.

The importance of creating and maintaining registers of microfilm masters has already been stressed at this conference. The resources available for preservation are scarce and difficult to obtain, and so it is essential to ensure that duplication is avoided. This means that the registers must be checked before a library embarks on a preservation microfilming programme, and that national and international policies should be developed to ensure coverage of material at risk without duplication. But it also means that librarians may have to adopt a radically different approach to their own collections, because, if one inexorably follows the logic, it leads to the conclusion that, in many cases when a brittle book is found on a library's shelves, the library makes no attempt to preserve it but simply leaves it there to decay in the knowledge that a microfilm copy can be obtained from the British Library, or from Harvard or Berlin the next time a reader asks for the book and it falls apart in his hands. That, as our American colleagues would say, is a whole new ball game. And I wonder how many of us could put our hands on our hearts and say that we could unreservedly espouse such a policy. It may be forced upon us.

But that, I venture to suggest, is a question for another day, and perhaps a theme for another National Preservation Office conference.
REFERENCES


2 Donald J. Waters, From microfilm to digital imagery: on the feasibility of a project to study the means, costs and benefits of converting large quantities of preserved library materials from microfilm to digital images, Washington, DC: Commission on Preservation and Access, 1991, p. 8.

3 See ref. 1, p. 19.

4 Peter G. Sparks, 'Some thoughts on paper as an information storage medium: a research review', Commission on Preservation and Access, number 40 (November - December 1991).


6 See ref. 2, p. 1.

7 See ref. 2, pp. 9-10.