A Healthy Heritage

Collecting for the Future of Medical History

Proceedings of a conference held at the Wellcome Trust

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Edited by Zineta Sabovic and David Pearson

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Foreword

Sir Henry Wellcome, who died in 1936, amassed huge collections of books and manuscripts relating to the history of medicine, which today form the core of the Library which bears his name. Successive generations of librarians and archivists have nurtured and developed his legacy, sustaining his vision of the importance of preserving the medical record of the past to illuminate the understanding of the present and the future. The Wellcome Library today is internationally renowned as a leading centre for the study of medical history.

Wellcome's collecting vision was wide, but manageable. It was still possible in the early decades of this century, with a sufficiently deep purse, to assemble documentary collections on the medical activity of previous centuries which could aspire to some sense of comprehensiveness. Looking at the situation we face today, with the mission to continue to build a resource that reflects the history of medicine, the challenges are much greater.

Today, medicine is everywhere and its documentation is vast. Quite apart from the proliferation of professional literature and the records created by all the processes of healthcare, there are many ways in which medicine is explored for wider audiences in all kinds of popular media. When does a day pass without the opportunity to see medicine explored on TV or in the newspapers? Medicine affects us all, as patients or practitioners. Just as the record of medicine itself has grown, so medical history has matured into an academic discipline interacting with a wider world of social and economic historians.

The 'Healthy Heritage' conference was called to discuss the challenges associated with preserving this growing record for the future. We do not have a national medical library in Britain, but a whole range of libraries and repositories, with different sizes, purposes and funding arrangements, all playing a part in safeguarding the documentation of medicine. We also have a professional climate which is well attuned to the issues associated with growth and change in information provision, and sympathetic to the notion of cooperating to maximize benefits and eliminate unnecessary duplication of effort. It was encouraging to see representatives from so many of those organizations come together for two days to explore the problems.

This publication contains the papers that were given at the conference, setting the scene, asking the questions, and raising awareness. It also includes a summary of the workshop discussions and recommendations from the second day of the conference. Since it took place, further meetings have been held with smaller groups, to take ideas forward, and plans are being laid to mount a cooperative project, starting in 2000 and based in the Wellcome Library, to map collection and retention policies in medical libraries. We will begin automating our Medical Archives and Manuscripts Survey (MAMS) later this year, to make it searchable through the Internet, and a web-mounted version of the Hospital Records Database is also under development. Elsewhere, the Research Support Libraries Programme (RSLP) has announced funding for a collaborative project to locate Scottish medical archives, and other initiatives under the RSLP banner will facilitate access to historic medical material. The British Library has sponsored a Co-operation and Partnership Programme, whose call for proposals will soon be announced. Things are happening, and there is scope for much more; let us all continue to work together to ensure that historians of the future are as well served as the present generation in their access to the past, by preserving the heritage and using the power of current technology to open it up.

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Introduction

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What is this conference all about, why are we holding it here, and what do we hope to achieve? The theme is meant to be defined succinctly by the subtitle: collecting for the future of medical history. The literature of the information professions and the conference circuit that goes with it are full of references to the explosive growth of information resources in the second half of the twentieth century, to the challenges of navigating round an increasingly complicated jungle, to the effects of the information revolution. Much of the effort, understandably, is directed towards getting up-to-date information to contemporary users – this is especially the case in the field of medical librarianship. This conference has a different slant. It's very much concerned with the explosive growth of resources, but in the context of their preservation for posterity rather than their use in the here and now.

Medicine, to quote Charles Rosenberg, is not only a body of knowledge but also an organic social function.[1] Practitioners and patients of today want access to current medical information for healing purposes, but people also want to know about medical history. Knowledge of medical practices and beliefs of the past helps us to place medicine in its proper context in society, makes for better patients and better doctors, who understand what medicine can and cannot do and what their relationship to the medical establishment ought to be. The medicine of the past can be applied for scientific or social scientific ends, or like any historical discipline it can deepen understanding of the human condition in all kinds of ways. For all these reasons it is worth study and in order to study it the evidence must be preserved.

The Wellcome Trust is well known as a central national focus for promoting the study of medical history, and its Library is one of the richest collections on that subject to be found anywhere in the world. It is not, however, all-embracing, and will become less so as time goes by. We try to keep our collections of publications about the history of medicine as comprehensive as possible, but the primary record of medicine grows at an alarming rate beyond the control of any individual repository. We are all probably familiar with the kinds of statistics that make people's brains hurt in this area, and we will hear more about them in the course of the conference – how half of everything ever published on medicine has appeared since 1970, how the number of biomedical journals published internationally has risen from about 20 000 in the early 1980s to a figure nearer 30 000 today. And the record of medicine is not confined to printed clinical literature, far from it; think of the huge quantity of administrative and other records created by those who explore or practice medicine, potentially archives for tomorrow, and think about the extent to which medicine is represented in broadcast and popular media. Think about the growing manifestation of medical activity in electronic formats, including electronic journals, multimedia material produced for teaching or diagnosis, and the vast mass of medical information available on the World Wide Web. The fragile nature of these formats is well known and it's only the exponential growth of the web that masks the rate at which material also disappears.

All of this represents the history of tomorrow. How are we going to preserve it? Of course we aren't, and most people would agree that not all of it needs to be preserved. We will also acknowledge that a great deal of preservative action is already going on in libraries and repositories all over the country, which are busily doing what they have always done in saving and organizing material. But we are equally familiar with a now well-established professional belief that traditional models of research libraries as all-embracing collecting centres are no longer sustainable, and that the future lies with collaborative access to a distributed resource. Nobody can do it alone. This is all very sensible, but it prompts a series of concerns. How do we ensure that, between the distributed collecting centres, effort is not unnecessarily duplicated, and that important material doesn't fall through the cracks? How do we ensure that the philosophy of access versus holdings is not pursued to the point where all of a sudden some things aren't held anywhere, and we end up with electronic goose chases through the ether in search of resources that have vanished? I do not myself believe that we have yet reached a point, in the march of technology, where we can confidently predict that all the resources which researchers will need will be held in digital

form in a few years', or even a few decades', time, although that's an interesting topic for debate. The circulation and delivery of information is one of the great professional priorities of our time, but let us not lose sight of the equal importance of the retention of information, a principle on which libraries have always been founded.

Collaboration and cooperation are likewise old professional friends which are much to the fore of all our minds today, and it is clear that these challenges can be best met by just those means. Many collaborative initiatives between libraries and repositories are already in place, and if we can further build on the framework to create a network of distributed responsibilities which can be sustained in harmony with local needs, we will make real progress. The climate ought to be right to achieve this, as cooperative action is on many people's agendas. The British Library has been keen to promote collaborative development of the national research resource for some years, and their recent strategic review exercise is likely to give this added momentum. For the higher education community, the Research Support Libraries Programme [RSLP] has just been set up with substantial funds to support collaborative initiatives in collection development and collection management. The funding can only be spent within the higher education sector, but there is a strong emphasis on cross-sectoral exercises, recognizing that the university libraries cannot do it alone, any more than any of us can. There are surely opportunities here which we should seize if we can but identify the right priorities and projects to carry forward.

When putting the programme for this conference together, we tried to think of all the different areas and formats that constitute the contemporary record of medicine, and some of them are covered in these published papers, including printed materials, archives, images and broadcast media. The coverage will certainly not be all-embracing, as medicine manifests itself in so many ways in our cultural output, and we must be open-minded in defining and preserving that record. We are not talking here only about clinical textbooks, or patient records. To put it another way, we must be wary of making assumptions about the research priorities of future generations, and of concentrating efforts disproportionately on particular kinds of material. Medical history has long since ceased to be defined solely as a chronology of scientific advances and interest in the wider social history of medicine, in the ways in which it has been perceived and received, seems unlikely to decline. I sometimes wonder which will be more heavily used by medical historians of the future, a run of the journal *Advances in Anatomic Pathology*, or a run of episodes of *Emergency Ward Ten*, that predecessor of *Casualty* and other medical soap operas so beloved of TV audiences the world over, that was screened over a ten-year period between 1957 and 1967. This last case can only be hypothetical, as there are in fact only two episodes of *Emergency Ward Ten* preserved for posterity from its several series in the National Film and Television Archive.[2] I think this is an area in which the advice and forecasting of our academic colleagues is vital, but let us not forget that librarians don't always have a good record for getting it right. The curators of the Bodleian Library in the seventeenth century sold off their copy of the first folio of Shakespeare's works, thinking it unlikely that it would be needed once they had a later edition.[3]

These then are the issues which this conference was set up to consider. What would be even better would be to emerge on the other side having defined some priorities and practical proposals which can be turned into action to address the issues. Let us try to define the projects which will help us to strengthen that sense of a distributed national resource to preserve the record of medicine. Posterity will complain whatever we do for it, but at least we must not let it accuse us of ignoring the issues.

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The present and future shape of the printed medical literature

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Introduction

This presentation looks at the state of print and the use of paper today. Included in this paper is a look at some of the developments in electronic journals, multimedia and electronic books, and the demise of scholarly publishing caused by the rise and rise of the Internet.

Paper today

The use of paper for writing and printing has soared in Britain in the last ten years – currently in the UK it is up by 65 per cent. The fastest growth this century has been in the 1980s which, perhaps interestingly, coincided with the rise of the personal computer. In the past five years, whilst the Internet has blossomed, production of writing and printing paper in North America has grown by over 13 per cent and worldwide it has doubled since 1982. The growth of electronic devices in the home has played a part in the torrent of paper and ink. Hewlett Packard estimated that, in 1996, 860 billion pages were spewed out of faxes, printers and copiers.

About 200 million pages of the *Wall Street Journal*, *The New York Times* and the *Washington Post* are viewed on the Web each month and these are increasingly being provided in formats for easier printing. Amazon, the world's first Internet bookshop, has sold old-fashioned paper books to 4.5 million people. The Starr Report, available free on the Net at several sites, went to the bestseller lists in its printed form.

Science, technology and medicine books	1992	1997
Number published	15 153	17 159
Price average		£40.64
Medical journals		32 000
Price average	£175.46	£306.58

Table 1
Print today

Statistics from Loughborough University (Table 1) produced each year show a comparison between science, technology and medical books in the years 1997 and 1992. The price average in 1997 for books was £40.64 which goes some way to explaining the rapidly diminishing library budgets in the health sector.

There are an estimated 32 000 medical journals produced around the world with an average price in 1997 of £306.58, compared to £175.46 in 1992. There are also bizarre extremes such as *Brain Research* from Reed Elsevier, which currently has an annual subscription price of US$15 000. Libraries who hold the journal may be interested to know that Reed Elsevier reported profits of £230 million on sales of £571 million in 1997 on scientific activities alone. One can perhaps begin to see why the demise of the scholarly publisher is now overdue.

The graph from the article by Wyatt *et al.* (Figure 1) illustrates the growth of the scientific literature. The graph shows an exponential curve with a doubling time of about 19 years. An article by Haynes *et al.* in 1986 reckoned that an experienced doctor uses about 2 million pieces of information. The British Library for instance takes in 8000 new items per day which results in more than eight miles of printed books per year. One problem is that journals exist to publish research which may be driven by the motives of career and curiosity rather than clinical need.
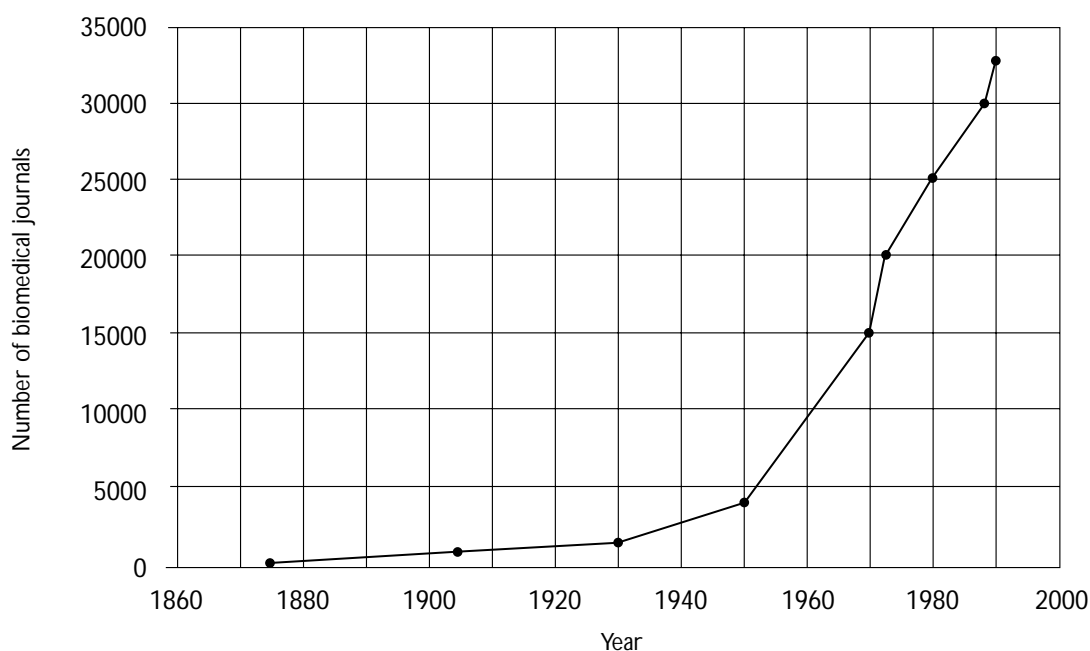
Figure 1
The growth of scientific literature
Source: Wyatt, J. Use and sources of medical knowledge, *The Lancet* 1991; 338:1368-73

Electronic journals

Electronic journals have proliferated over the last couple of years. Four years ago there were just 360 journals on the web; now Reed Elsevier have 1200, Springer have 360 and Academic Press have 174. The National Technical Centre for Denmark is now phasing out print in favour of web delivery of journals to its users' desktops and, through cost savings, plans to increase subscriptions by 25 per cent. The electronic journal does not need cataloguing, shelving or binding.

We have also seen the 'electronic only' journal of which there are now about 100 titles. One of the first was the online journal of *Current Clinical Trials*, uptake of which was hindered by its far from perfect interface.

Links from MedLine on the Internet to full text has made the growth of a form of 'one-stop shopping' a reality. Users can search and then click through to full text of the article, which includes charts and other graphics. Ovid Technologies provides access to more than 300 journals and is increasing its portfolio by 30 a month. Last year it was bought by Wolters Kluwer for $200 million.

Consortia are getting together – both library and user based – to force down the price of electronic content. Two examples are NESLI (National Electronic Site Licence Initiative) in the UK which is serving the higher education system, and Ohiolink in the USA which serves 74 libraries and provides a common user interface.

Highwire Press is a not-for-profit publisher set up by Stanford University Libraries and Academic Information Services to help universities and learned societies publish at low cost. The journals are mainly American but the *British Medical Journal* is now available via the HighWire site and many more will be joining. Currently Highwire has more than 100 journals on its site including the *Journal of Biological Chemistry*, which is the world's most cited journal. HighWire's idea is to correct the market by increasing the output and quality of scholarly publications. Oxford University Press has just transferred 160 of its journals to HighWire.

Multimedia

Multimedia has grown dramatically over the last few years. In 1993 there were very few titles on CD-ROM but these seem to have proliferated greatly over the last few years especially from publishers such as Mosby. For instance, the latest *Computer Teaching Initiative Centre for Medicine Newsletter* reviews 29 new titles.

Many of the products are not true multimedia and very few are truly interactive. Many are books placed onto CD-ROM and, as such, are very difficult to read and use. The majority are educational, and there is a preponderance of anatomy and physiology titles as these subjects can be truly visual. Some titles have become well known such as ADAM, *Animated Dissection of Anatomy in Medicine*, which is more of a work of art than a true teaching aid. Some multimedia packages are purely Web based such as the Virtual Hospital, which is a radiological textbook package.

Electronic books

Electronic books or e-books will be available for general use in the very near future. There are also web developments where sites make available the texts of classic literature. One such is Project Gutenberg, a site dedicated to providing the world's classic texts online for reading or downloading to your laptop. Apple has made an early attempt to create e-books by providing Newton Press, which was a publishing package for their Newton handheld device.

True handheld e-books will be with us over the next couple of years. Based on a codex-like approach – by doing away with scrolling, the Nuovomedia Rocket e-book is the size and weight of a large paperback, with no scrolling text and a paper white screen. The resolution is higher than a standard computer (often a complaint about reading text from computers) and the backlighting means you can read it from any angle. Both the Rocket and the Librius download content from the Internet and the Rocket goes some way to placating publishers by only allowing one machine to read one copy of a book.

The Internet

The Internet is seen as the vehicle to cause the downfall of the scholarly publication. As publishers are seen to be making more and more profit, schemes to circumvent the traditional role of publishing are being investigated.

One of these started at the Los Alamos Nuclear site in the area of physics publishing in 1991. The brainchild of Paul Ginsparg, it currently receives some 25 000 new articles annually and it has become the primary means of communication for physicians. This has been acknowledged by traditional journals who now link to the site.

Web communities for certain subjects have sprung up where a user can get all the information he needs from one site. In the medical arena BioMedNet is taking on the role with access to MedLine and added electronic content, including conference information, directories of suppliers and a discussion list.

The web is leading publishers to the idea of virtual peer review. The *British Medical Journal* is piloting a scheme where new papers are mounted for open online peer review. It wants to establish whether naming referees affects the quality of reviewing, i.e. whether a young reviewer might feel intimidated by reviewing his elders for fear of retaliation.

The growth of the web has promulgated the idea of the digital or electronic library. Two examples are the work currently being done by the Brazilian Medlars Centre – BIREME – on the Virtual Health Library and our very own National Electronic Library of Health, which is still very much in the planning stage but has the goal of providing quality knowledge to both health professionals and the public..

Conclusions
Overall I think that paper is going to be with us for a while yet even with extreme cases like the Danish National Technical Centre before us. This will lead to the concept of the hybrid library which takes both

print and electronic material. We can see from Jeremy Wyatt's 1991 figures that there is still a lot of material out there yet to be made available electronically and there are thousands of small publishers who don't have the funding to mount journals electronically, although sites like HighWire are helping learned societies to achieve this.

We must preserve the printed medical literature as archiving of electronic material is still a problem compared to the comparative ease with which paper can be kept. You also don't have the problem of upgrading with paper. If you can read a first folio of Shakespeare you can read the latest copy of a Pinter script.

In the USA a 'belt and braces' approach is being taken by JSTOR – a not-for-profit body set up for the electronic archiving of journals. It scans back issues and generates both printable bitmap images for faithful copies and OCR copies which may be of lesser quality but can be searched.

People still prefer the paper version of a book. Studies done by both IBM and Kent State University showed that paper could be read 30 per cent faster than the screen and that there was a strong preference for portrait orientation (unlike computer screens) and two-page spreads.

Projects like Turning the Pages from the British Library are innovative and interesting, and go some way to simulating the experience of actually reading a book.

I would like to finish by quoting the Chief Executive of the British Library. I was reading through a talk given by him in Washington and he talks about an item in our collection which is a letter written by the Duke of Wellington after the Battle of Waterloo where he is writing about the losses suffered by the British troops in the battle. The paper is covered with marks of his tears as he wrote – try reconstructing that on a computer.

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The archival record of medical activity

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It has been said that medical history is the most undocumented area in the history disciplines. I beg to disagree, especially for the twentieth century, but I do think that with medical history, one needs to look harder to find the evidence, because it is not always contained in medical records. One has to look at many other kinds of records and other sources of information when doing research on medical history. In the half-hour that I have been assigned I am not going to be able to do very much more than outline the present situation relating to the preservation of all these records and make some suggestions about how I think problems could be addressed.

Discussion about selection and preservation of these records is not new. Indeed 20 years ago the Contemporary Medical Archives Centre [CMAC] was established because the Wellcome Trust recognized that there was a need to look at these problems and to do something about saving records and papers in this field. There have been many meetings and much action over the last 20 years not least by the CMAC. What is new is that there are different issues emerging now such as electronic record keeping, the Data Protection Act and the proposed Freedom of Information Act.

What do we mean by the recent past? What records and archives are we talking about? Where are they being kept? What is not being kept? What are record managers and archivists doing at the moment? How are they making their decisions?

The recent past

Firstly, what is meant by 'the recent past'? Is it possible to talk simply of the last few decades? I believe that this poses a problem with archives, because they do not neatly adjust to dates: they reflect the work of individuals and organizations and therefore they can cover very long time spans. Hospitals, for example, have existed for many hundreds of years and it would be misguided to concentrate only on the last few years or decades of their documentation out of context, in their own time capsule. In addition, one cannot always know in advance what is going to turn up when you are talking about archives. Personal papers and archives emerge on the market from people, from their basements and attics, and from professional vendors. We cannot know what is out there even if we can have a good attempt at guessing. So we need to have some flexibility in our dealing with archives and the date span.

What records and archives are involved?

The biggest category, obviously, is National Health Service [NHS] records and within that hospital records and NHS Trust records, both administrative and patient records. Within the NHS there are many other categories of records being created: local health authorities are producing large quantities of material, primary care records, general practice records, community health records. There are also the records produced by private hospitals. Nursing records are a matter of concern to historians and to the Royal College of Nursing at the moment. Records created by private consultants sometimes survive as well. We have a marvellous set of clinical records in the papers of Frederick Parkes Weber (1863–1962) held in the Wellcome, which date from the 1890s. On the reverse of the photographs of patients are his or her clinical record. Then there are business records in huge quantities, not just for the pharmaceutical industry, but records that cover the support side of medical care, the equipment and apparatus, the buildings and fabric around medicine and research. Research records created by individuals and by institutions are extensive: examples held with us are the Lister Institute and the Strangeways Research Laboratories, archives of both containing a large amount of printed grey literature. And increasingly there is research by universities and private bodies, creating large quantities of documentation. There are now international interdisciplinary teams, for example the Human Genome Project. Social science research data can also be important for historians. In addition, there are records of grant bodies such as the Wellcome Trust and the Beit Trust. Medical charities such as the National Birthday Trust Fund or BACUP (whose archives are with us), large and small, some of them doing their own medical research

and many just helping give patients or their families care and advice. Very many pressure groups exist to influence the public and the Government in various ways on medical issues – examples with us [the CMAC] are the Abortion Law Reform Association, Eugenics Society, the Voluntary Euthanasia Society – and their records can be particularly useful as indicators of public opinion. Records of professional bodies such as the British Medical Association, the Physiological Society, the Health Visitors' Association, the Chartered Society of Physiotherapists are also important.

Where are all these records being kept?

The Public Record Office [PRO] is an obvious place to start, holding the archives of government, but I think it is also worth remembering that it is not just in the Ministry of Health and the Local Government departments' archives that one would find material relating to medicine. The Health and Safety Executive, the Home Office, the Department of Education and Science, Agriculture, Fisheries and Food and many other departments (for full information on this see the PRO entry for the Medical Archives and Manuscripts Survey [MAMS] held by the Wellcome Library). The Medical Research Council [MRC] archives are there, and deposited collections of health-related bodies such as the General Nursing Council and Central Midwives Board. The PRO are also concerned about data archives and electronic records, and have recently set up a UK National Digital Archive (NDAD) in the University of London giving access to government data sets. More electronic records are held by the Data Archive at the University of Essex, which holds machine-readable copies of humanities and social sciences data sets.

A very large amount of records of importance to medical research is held throughout the country in local authority, county record offices, borough record offices, and specialist repositories, university libraries and royal colleges such as the Royal College of Physicians.

Then, of course, there is all the archival material that is still sitting where it has been created, in institutions, societies, associations and charities, and in hospitals, which I have already mentioned. A great deal has been placed in record offices up and down the country, as well as remaining in the hospital. There are so many hospitals and so many records surviving that have been placed in record offices that in 1985 the Wellcome actually started a survey with the Public Record Office to record this information.

I will digress here to say something about the Hospital Records Project. It is worth reminding people that hospital records are public records in this country and therefore have to be placed in a repository recognized by the Public Record Office. This has meant that most hospital records, when they have left the hospital, end up in county record offices and the purpose of the Hospital Records Database is to keep a location record of them. We now have information on records of over 2500 hospitals up and down the country. Much of that information covers twentieth-century records. About 700 entries, between a third and a quarter, actually include patient records. So I think we need to remember that there are a lot of patient records already in record offices up and down the country.

The database contains information such as the name of the hospital and background information: the type of hospital, pre- and post-1948; general, isolation, maternity etc., and the status of the hospital, whether it is voluntary, poor law and so on. There is a breakdown of the type of administrative record held, for example, admission and discharge records, pictorial records or nursing records, with the covering dates. Also information about clinical records, and their covering dates, and then finally where the records are actually held and what sort of finding aids there are to them. It is a very powerful database. One can search in a variety of ways, not simply by the name of the hospital. Date searching is also possible. At the moment the database is available in the Wellcome Library and at the Public Record Office, but we aim to mount it on the websites of both places by the end of this year.

The other way of finding out where medical archives are held is through the National Register of Archives (which comes under the Royal Commission on Historical Manuscripts). Every year they produce a digest of material that is supplied to them from repositories and it is evident there is a great deal of material moving into record offices, the majority of which is twentieth-century. Incidentally, about 20 per cent of public records are housed locally and a lot of those are hospital records.

Another interesting fact to bear in mind is that the proportion of records normally being retained, whether institutional or individual, is between 3 and 7 per cent. The PRO reckon to keep about 5 per cent of any activity, so there are strategies in place to deal with this quantity and a lot of selection and weeding is taking place.

What is not being kept?

My personal 'at-risk register' would include certain fields of medicine. The CMAC has found that it has acquired less in the field of surgery than other branches of medicine. I don't know what this says about the way surgeons keep records or whether they are less likely to create them. Having said that, we have just received an important accession of papers of R T Johnson, the neurosurgeon. But an area that does give me quite a lot of concern is alternative and complementary medicine. Given that so many people turn to this nowadays, the archives reflecting this are not finding their way into repositories. Also at risk are records from smaller voluntary organizations and charities which do not have a permanent address and their secretariats move from place to place, with records transferred or discarded with changes of officer.

Then there are certain types of material particularly at risk, and patient records is the one area that seems to dominate the historian's concern. It has been a particular issue here I suspect, partly because of the huge changes within the NHS in recent years and the closure of so many large psychiatric hospitals. Patient records in volume form have been more likely to survive than those in files, which mostly date from the 1920s and 1930s. There are many other issues involved, not least the access to patient records, which is where the Data Protection and Freedom of Information Acts will also play a part, and I sincerely hope that these Acts will not increase our problems in saving and preserving these records for future research.

Images of some subjects are also at risk: photographs of routine laboratory research for example. Fortunately the Physiological Society has picked up on this and is now undertaking a project to photograph research work in laboratories.

Records in electronic format pose their own challenges and unless those are addressed they will also be at risk. In some ways there are advantages coming out of electronic records, not least if we microfilm and digitize and can then undertake free-text searching. But there are problems of constant platform changes, the need for periodic transfer of the data to new media and new software. And new formats do not obviate the need for good organization of the records in the first place. We are all having to work on technical and management solutions and watch very carefully what, for example, the Public Record Office is doing in this field. They have said that they still envisage that we will be looking at paper records for at least 30 years, so selection of paper records is still something that we need to think about.

Finally a category 'at risk' I would argue, is the good-quality records. Our long experience in this work has shown us that the archives that have survived from organizations have sometimes been very poor, because many of the key documents have been thrown away, especially minutes and annual reports. This is really disheartening, because they make all the difference to the understanding of the achievements and work of those bodies, and to using the rest of the surviving records adequately.

What are we doing at the moment about all this?

It would be wrong to suggest that nothing is being done. There are certainly more professional archivists and records managers in posts in health authorities and health boards now. Scotland has more professional archivists in the health boards than England, and we sometimes envy them, although I know that Mike Barfoot will say there are problems up there in Scotland as well. Archivists and records managers in this field have produced a lot of guidance over the last few years. An Audit Commission Report, *Setting the Record Straight: A study of hospital records*, appeared in 1995. We are all eagerly awaiting the NHS Records Management Circular for Health Records to be issued soon [now issued as HSC 1999/053 available on the web at www.doh.gov.uk/nhsexec/forrec.htm]. This has been discussed over many months now. It replaces the previous circular HC (89)20, which came out in 1989. The Wellcome's Glasgow Unit for the History of Medicine produced *Selecting Clinical Records for Long-term*

Preservation (1993), which came up with the figure of 5 per cent of patient records being an acceptable amount for permanent preservation. The Health Archives Group have also produced a book *Hospital Patient Case Records: A guide to their retention and disposal* (1996), which was issued free to archivists and those in charge of records in hospitals to help them make their decisions about selecting clinical records.

There has been a lot of work and discussion going on behind the scenes and there are several special interest groups – for example, the Health Archives Group I have just mentioned, and the Charity Archivists and Records Management Group (CHARM) which includes medical charities. Local initiatives based in the Universities of Exeter, Edinburgh, Manchester and Norwich are looking at different aspects of medical records and survey work.

Surveys are a vital tool in all this. I have mentioned the Hospital Records Database Survey. Within the Wellcome we have also conducted a Medical Archives and Manuscripts Survey (MAMS) for many years. The Trust has supported the Business Archives Council [BAC] with two surveys, and the results of one, the Pharmaceutical Industry Database Survey, are now available in the Library. The Trust is now funding a survey of veterinary medicine by the BAC. Sheffield University last year finished its own survey of the hospices, the British Institute of Radiology survey radiology archives and equipment, and so on. I could go on, there are many surveys being conducted by interested parties.

Many meetings have been held. Today's is one example, but there are still others going on. The London Archive Users' Forum held a meeting on medical records late last year, and there is a lot of information sharing going on via mail-base discussion groups and websites.

How are we making the decisions?

As archivists are aware, acquisition policies are of fundamental importance, although having said that, they are sometimes, of necessity, so broad, that one wonders what use they are. The Australian archives acquisition policies for example have the catch-all phrase about records which will 'benefit society', and the Public Record Office mentions 'documentation of the social and economic condition of the United Kingdom'. There is a need for those places that are collecting archives to have clear ideas of what they intend to hold and to work properly within selection procedures.

It is hard making decisions on what to keep when, as I have said before, we cannot always know what is going to turn up, and it is not simply as straightforward as getting a list of what's being published and pulling out the items that one wants when it comes to archives. An indication of that was a recent report that Iceland's comprehensive medical records can divulge the 'Holy Grail of medical research', namely genetic disease: a Pandora's Box has been opened. The CMAC has always kept very good records of the enquiries that are made on hospital records and on researcher's topics and I think these could yield some useful information on what is being used for archival research, for medical research. One point there that comes out is that on hospital records 80 per cent of the enquiries are genealogical or family history, not arising from other academic research.

Documentation strategies (a concept that has been developed in the USA) exist to deal with this. They are very useful, especially when applied to a single organization, looking at what records that organization has produced and what one would hope will survive from it, rather than simply passively accepting what has survived and dealing with that at the archive end. Documentation strategies are, in my opinion, less effective when applied across a whole subject field, especially one as large as health research and healthcare, but there are lessons to be learnt from the documentation strategies that we have got from America.[1]

As mentioned, surveys are a vital means of finding out what there is and then identifying what specific areas need particular attention. Examples are the AIDS archives survey and a psychology survey is also planned.[2] We need to be proactive in specific areas, to coordinate our information and our approaches to those areas. We need to talk together, we need to be pragmatic. I am also a great believer in serendipity, because I do think that the unexpected frequently throws up important things, and therefore we need a great deal of flexibility as well as planning.

Summary

There is a huge amount of medical records in existence which cannot all be kept. We know that we cannot keep even part of it all in one place and it's going to have to be dispersed in many places (as it is at the moment), not only in repositories, but a lot of it will also remain where it is being created. The resource restraints are considerable and that is going to lead us to make some hard decisions, possibly de-accessioning in some instances, something that archivists are talking about, but something we have to be very, very wary of. If we are to de-accession because of under-use, we have to be clear that that material has been known about and accessible for research use. Certainly some categories of material are more at risk. This may be because they have been overlooked as a useful source, which comes back to what I said right at the beginning that with medical history it is not always clear that archives can be of medical historical interest, we have to look a bit harder to see what we are using. I have indicated that there are different ways that the appraisal and selection process can be (and is being) handled, that there are professionals who have good ideas about how to do that, but these issues need to be tackled by all of us talking together and using mechanisms such as surveys and local initiatives to gather information.

We cannot resolve this just by us talking here and there is no single solution. What we can do, though, is to try to work together to better practice. Guidance is important, but it is not enough to produce useful books saying this is how it should be, without following it through and giving practical advice and training. This came out very clearly to me at the Exeter meeting recently when the Department of Health Guidance was discussed and people working in the health field made it clear that practical assistance was required to implement it. We want education on records management and records management strategy and that should go right down to the organizations that are producing the material. These issues need to be addressed and seen as a vital part of the records continuum, not something to be thought about at the end of the process. We want those clear collecting policies, so that we can be realistic about what we are going to keep. I think there is a certain onus on historians to explain their needs as far as they can, and to help us in our attempt to save that material by showing that the usage will be there. I know that is a bit difficult, but the fact for example that so many hospital record queries are for genealogical research poses problems for some archivists who could be faced with retaining huge quantities of hospital records mainly for genealogical research, which they may feel is not enough reason for their long-term preservation. We need not only to continue to undertake surveys, but to feed information back into existing surveys. There is a strong possibility of re-inventing the wheel here and we should be very careful about starting new surveys rather than building on existing ones.

Finance is crucial. We all need more money and I would argue that it is of fundamental importance that the material gets catalogued. With archives it is impossible to use the material, to find out what is there, until it is properly sorted and catalogued. The Wellcome Trust has funded medical history research for many years, but the means and tools by which that research is done need to be available. The possibility of a Trust-funding scheme to support documentary collections is currently being investigated and I hope it will come to fruition.

Existing expertise should be built on. The professionals both at the Public Record Office, the Wellcome, the Health Board archivists, and agencies such as the Health Archives Group, the Charity Archivists and Records Managers group and professional bodies like the Society of Archivists, should all be involved in future planning for this.

Communication is essential. There must be dialogue between the archivists and especially, between the archivists and those who are creating the records, so that the archivists are not just handed messy quantities of material in a vacuum, without knowing its importance and its significance. So, in conclusion, I would argue very strongly for the need for creators, managers, archivists, health professionals, historians and epidemiologists to get together. That is going to help, if not resolve, our path through some of this quagmire so that we don't end up with a mound of totally unintelligible records. We want to make sure that Pandora's box contains the best possible selection of archives for posterity.

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The changing truth: capturing electronic medical knowledge

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'Medical knowledge' is rather an intangible concept, but we need to be clear about what we mean. What is it? Knowledge is a property of intelligent agents, in this case typically doctors and nurses, that helps them make better quality decisions and take actions which are generally regarded as sound rather than faulty. Bruce Madge has already shown my graph[1] of the number of biomedical journals indexed by the National Library of Medicine over about a hundred-year period. It's a surprisingly good fit to an exponential curve with a doubling time of about 20 years, a very sobering thought, because this means that in a century's time we are going to have 320 times as much stuff out there, whether you are looking at paper or electronic journals. So the volume problem is real.

Unfortunately we can't just count medical textbooks, or review articles. This follows from a piece of work done by Antman and Chalmers at Harvard in the early 90s,[2] who compared statements in these sources with trial results. Taking as an example streptokinase, the blockbuster drug used in heart attacks which saves lives, they compared what a meta-analysis of trials published in journals would have concluded against what the experts writing textbooks, and unstructured review articles, were saying over about a 20- or 30-year period. Surprisingly the first trial on streptokinase was carried out in 1959. It was a very small trial but hinted that this might be a useful agent. There were several more studies until by 1973 enough studies had been done so that had anybody done a rigorous search, found all those good-quality studies and combined them, they would have come to the conclusion that streptokinase was definitely a life-saving drug in patients with heart attacks. Unfortunately, they didn't do that, and as a result the experts, who were being invited to write textbook chapters or review articles, weren't recommending streptokinase, so it wasn't actually being used in practice. You had to wait another 13 years until the majority of experts writing textbook chapters were stating that streptokinase is a good thing – the knowledge then passed very rapidly into clinical practice and so, according to your definition of medical knowledge – is it what experts know or is it what the literature shows? – you would have a very different impression in the mid-70s about the truth about streptokinase. This example illustrates one of the big problems, that if we simply preserved review articles, the textbooks wouldn't actually have an accurate history of our knowledge about streptokinase. We would need to have access to all those journals, whose volume is doubling every 20 years. An alternative is to store the products of the Cochrane Collaboration, which is looking continually at the literature and assembling the 'truth', if you like, from all the trials.[3] If you decided in a hundred years time that you didn't have resources to search all the journals, you would probably go to Cochrane systematic reviews, because they have been continuously updated based on the literature. So that would be one shortcut to the best medical knowledge.

Of course, there are other forms of medical knowledge, for example, people's individual skills and experience, wisdom and opinions which don't ever get into the journals. We mustn't ignore these. Some of the forms in which this kind of knowledge is conveyed includes clinic letters, leaflets for patients (many doctors produce a handout for their patients about a specific condition or treatment) discussions on ward rounds[4] and so on. It would clearly be very difficult to capture those and preserve them, although there are methods for doing that. Sometimes they turn up as electronic documents, such as electronic mail, word-processed documents, or personal web pages, and one begins to have a way of preserving those, but again there is a huge quantity and selecting may be very difficult.

The kind of material that we are more familiar with preserving is what I would call shared knowledge, for example the results of clinical studies, the kind of consensus that experts around a table might come up with when they are developing a practice guideline, say under the auspices of a Royal College, and those are often published using conventional or electronic media. But there's quite a variety of different electronic media, ranging from e-mail discussion lists, news groups, compact disc products, packages for computer-aided learning or decision support systems. They can even include very transient media, such as television. For example, there is a television channel that broadcasts programmes on cardiology at three o'clock in the morning. You are meant to set your video recorder, I don't think you are meant to stay up,

though cardiologists do work hard of course. Potentially one could store video tapes of those programmes, but will they be readable in 50 or 100 years?

Another way in which medical knowledge is disseminated is in computer-based packages. Path Finder is a commercial decision-support system for use by pathologists, which captures a lot of knowledge from experts and from empirical studies.[5] You can see from its advert that this kind of computer is already looking a little outdated, will that computer be available in 20 or 30 years' time to run that package again? It's very doubtful. And of course many of these products don't actually make it to the stage of a commercial product. Another system like this, again now looking rather dated, is ACORN, a decision support system we developed to help in the diagnosis and management of patients with chest pain.[6] I don't know now what happened to the knowledge that's in the ACORN knowledge base, but at the time it was quite a broad-ranging assembly of expert knowledge and knowledge derived from empirical data.

And then, of course, we have the World Wide Web. OncoLink [www.oncolink.upenn.edu] is actually a very high-quality, comprehensive source and I would recommended it to anybody who's interested in looking up any information about cancer diagnosis and treatment. But many doctors are not quite as open to the web, which has been described like eavesdropping on a cocktail party, the world's largest vanity press, etc. That *New Scientist* comment was actually a comment on a study which I will mention in a moment and there have been problems with people's perception of the web and with the quality of knowledge on the web. Why is that? Well, certainly if you trawl on the web, looking under terms such as 'smart drugs' or 'alternative medicine' you'll find a lot of very bizarre claims. For example, hydrazine, which is a rocket-fuel, is claimed to help people with wasting disease caused by cancer. I don't know what's in pine bark, maybe there's something useful there, but the claims that are made, freeing you from cancer in 14 days, seem a little implausible. This is one of the reasons I think the World Wide Web doesn't have such a great reputation amongst clinicians.[7] There are other specific problems. For example, some of the search tools that were available in the past were biased, essentially your site went to the top of the list if you paid enough money. Other commercial organizations have tried to use the web by encouraging the pharmaceutical industry to set up patient discussion groups to try and enhance the take up of medications by side-stepping the doctor–patient relationship. Now I don't believe that many drug companies have done that, but nevertheless one company certainly organized two conferences, on the theme of the pharmaceutical industry and the Internet, how it can be used to bring information to patients for commercial reasons. I think these kind of problems have caused people to be a bit more sceptical about the quality of knowledge on the web. But perhaps the clearest evidence that some of the knowledge out there is not good, was a paper published in the *British Medical Journal* [www.bmj.com] a couple of years ago, in which the authors surveyed about 40 websites designed for the parents of sick children, specifically children with fever.[8] Two or three of those websites actually recommended dangerous treatments, including aspirin which can cause something called Reye's syndrome in children with fever; only 10 per cent of sites actually adhered closely to recommend guidelines. So it would be hard to call the other 90 per cent high-quality knowledge.[9]

I think for this reason and because of the quantity problem that I mentioned earlier, we are going to have to resign ourselves, grit our teeth, and actively select knowledge sources for preservation. Obviously that prompts a range of issues. For example, whose criteria should we use for selection? And how are we going to identify sources that meet those criteria with the huge number of websites that are out there? How can an archivist locate sources that meet these criteria? A number of groups have proposed quality criteria for the web, including the Health on the Net Foundation in Geneva (www.hon.ch/HONcode/ Conduct.html), which have quite generous criteria. For example, if your website says who the owner is and if you update it regularly then you can put their logo on your website. There are more strict criteria, such as those used by OMNI (www.omni.ac.uk), and there are emerging criteria for the National Electronic Library for Health, which emphasize not the quality of the content, which is often very difficult to access, but the quality of the process that's used for assembling the knowledge. If this process is reliable and high quality, then it's likely that the knowledge that's generated is high quality.

Obviously, we could also look at a number of alternative ways of identifying sites for archiving, simply looking at the most popular sites, for example, might be one strategy. The alternative would be to use some or all of these criteria, and the technology of PICS labels could help to mark high-quality sites automatically.[10]

But let's just quickly discuss the OMNI quality. OMNI stands for Organising Medical Networked Information. You can find it on the web at www.omni.ac.uk and it's a pathfinder site, i.e. you go there and it gives you a list of sites that have passed its criteria which are high-quality patient information sources. They now have several thousand sites linked through them and they regularly assess the quality of the sites, using various criteria. For example, does the site say what it's for, who the audience are, does it say where it gets its information, what its source of authority is, and where the funding comes from? They also look at the content as much as they can, check for obvious errors, how up to date it is and whether it's unusual or whether it's just one more source of information on say rheumatoid arthritis, so they do try to select sites because of their unique contribution. They also have a very pragmatic view. They reckon that a high-quality site which says where all the information comes from is no use to anybody if you can't get access to the information within it, so they check the time taken to get through, check the viability of the links, the language that's used, the design of the user interface – whether you can find your way around, don't get lost in hyperspace and so on. So they look at the very important elements. If it was left to me, I think probably some variation or development of the OMNI criteria might be a very good place to start if you are looking for medical or health sites to archive selectively.

I mentioned the technology of PICS labels. These were originally developed for adult sites on the Internet; the idea is that any site can have a label which tells your browser whether or not you should view it. In the context of healthcare that label could be whether the content is based on rigorous studies or whether it's just one patient's personal experience – either of which you might want to preserve. However, you might prefer only to see sites that are summarizing the world literature like the Cochrane Collaboration site does [www.cochrane.co.uk]. One of the clever things about PICS labels is that you can have independent sites carrying just the labels, so you don't have to rely on the publishers' claims about what they are doing. You can ask an organization, for example the British Medical Association or a Royal College, to label sites independently – or OMNI could use this technique for labelling sites which pass their criteria. Your browser would then be set to use that 'indirect' labelling site instead. So PICS is an emerging technology which will allow archivists or others interested in selecting those sites which meet some criteria, to do this semi-automatically.

But even when you have set up your quality criteria, once you have resigned yourself to having to be selective, you have still got to store some frozen version of that electronic resource in a safe form. I am not an archivist and I don't know how easy it is to do that, but my guess is that this itself is actually quite tricky. The next problem is in 20, 50, or 100 years' time you are going to have to gain access to the material in that frozen version, on that store. Now we'd be talking about storing things on say CD-ROM, but my guess is that as many people in 20 years' time will have a CD-ROM player as currently have $5\frac{1}{4}$ inch disc drives on their personal computer. Those of you with long memories will recall that 8-inch disc drives came first. Anybody with an 8-inch disc drive out there? No. Well it was only in the early 80s that those went out – less than 20 years ago. So you can see that even if you put electronic knowledge onto the most current and durable medium, there is going to be a problem. There was an interesting article in *Scientific American* by Rothenburg,[11] in which he discussed the need to set up computer museums that would preserve old hardware, and also the operating systems and the software, so that people who did have ancient data preserved would still be able to get access to it.

However, the problem is that merely getting access to the data, or even being able to run the application, may not in fact be enough. We also need to archive the rules that were used for indexing. For example, how am I going to find material on steroid sparing agents in asthma unless I know what the index terms were and how they were applied in this vast catalogue of journal articles? Even if these are available, any librarian will tell you that they often use tactics to come up with the target material which are actually rather different from the ones you would guess, knowing how the indexes were constructed and the search engine works. Archiving such know-how, about how to use the application and the search strategy, may be a good deal more difficult.[12]

I have used the example of 8-inch disc drives to illustrate problems with computer hardware. Of course, computers and automata have been around for much longer than you imagine. There was a nineteenth-century automaton chess player which used a drum to store the playing sequence. You could preserve the drum, but unless you had the automaton chess player, you wouldn't be able to tell by inspection what

kind of chess tactics were stored, what the level of understanding of the game was, just from that drum. So you would have to store away the machine as well, and this is exactly the problem with electronic knowledge sources, to which we do not yet have a satisfactory answer. Another example is the decision support system ACORN that I mentioned earlier. Somebody in 20 or 50 years' time who knew nothing about it would find it very difficult without the right kinds of software that actually brings it alive.

I talked about interpreting or using the search strategy and the know how that's needed for that. There are, of course, other more mundane challenges. For example, it's surprising how often mis-spelling creeps in or concepts are reinvented which were actually known about 20, 50, or even 100 years ago. If a concept is present and then it disappears and then it comes up again, what happened in the interim? Was it just forgotten, was it discredited in some way but you don't know why because you are missing that bit of the archive, or was it a reinvention the second time round? And of course sometimes there's fraud as well, which could further complicate things.

Another problem is that the meaning of words change. Before we knew HIV infection caused AIDS we just called it AIDS, but you may well find patients described as having AIDS back in the early 1980s before HIV was discovered, who actually wouldn't fulfil the definitions for HIV infection now. And there are other dinosaurs, such as many of the medical eponyms which have disappeared because of greater understanding of physiology and anatomy. With the revolution in molecular biology there may be a further wave of changes in the naming of diseases and our understanding of them, because we understand the mechanism at a greater level of detail. And then, of course, there's the changing cultural context of healthcare – an example would be the expert reviews that I mentioned earlier. Now opinion is moving away from these in favour of systematic reviews such as those produced by the Cochrane Collaboration, but they are both kinds of reviews, and they may come to different conclusions. So without understanding the evidence-based health movement[13] and the reasons why systematic reviews come to different conclusions from expert or authority reviews, it would be difficult to appreciate fully the electronic knowledge store. There are other more local considerations. For example, the kind of practice guidelines that the Royal Colleges generate now will be different from the kind of guidelines that the National Institute for Clinical Excellence are going to develop or hallmark. It will be very interesting to see as that body comes into its own what effect that will have on the guidelines movement, for example whether new kinds of evidence will be incorporated into guidelines, particularly evidence about cost. So the interpretation of knowledge over time is going to be quite difficult and subtle.

To summarize and conclude, I think we have a big problem with the enormous amounts of healthcare knowledge. Just the simple fact that if things go on as they have in the last hundred years, there will be 300 times as many biomedical journals, means that there is a big threat to medical history and archiving. Some of the sources, of course, will be much more transient – television programmes and so on. Getting access to electronic knowledge will provide very significant problems and interpreting what you have got may be even more tricky. Maybe the answer is to just archive everything in case it's of interest, but I think the problems of cost and resources will break that initiative. One answer might be to involve those with a vested interest, for example the lawyers who defend doctors in a negligence claim or the Medical Protection Society, or similar professional indemnity societies. These all have an interest in preserving electronic knowledge, because if somebody sues a doctor in 20 years who was using the Cochrane Database on pregnancy and childbirth in 1999, then the court of law would want to see what was in that electronic knowledge source, and so they will certainly want to try and preserve it.[14]

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'The image of medicine'

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When discussing the future of medical history, and the collecting strategies that will most benefit the historian of tomorrow, one is struck by the range and diversity of material suggested by the phrase 'the image of medicine'. In one sense this phrase may be too broad to be useful, forcing together a diverse range of documents and artefacts, encompassing this century's wealth of still, as well as moving, images. However, despite the practical, archival and curatorial difficulties of placing all 'images' in one category, I believe 'the image of medicine' helps draw attention to a particular aspect of medicine's past, its public image. When asked to speak at this conference, I took the phrase to mean just that, the actively constructed and continuously contested image of what medicine is, has been and should be.

As a contemporary historian interested in post-war Britain I would single out the media and audiovisual media in particular, as the key forum in which this sense of medicine's image has been built, maintained, defended and, at times, lost. My focus on audiovisual media may seem too narrow, excluding other image-making activities and other mass media forms. It is worth noting, however, that audiovisual sources, especially television sources, are woefully underused by historians and virtually untouched by medical historians.[1] Indeed, if the main criterion for preserving audiovisual material was current use by historians, then there would be little hope of saving anything at all. In what follows, therefore, I want to do two things. I want to encourage my fellow medical historians to make use of audiovisual sources and I want to voice my concern, or rather my confusion, about the future of our audiovisual heritage in light of the Report of the Working Party on Legal Deposit, chaired by Sir Anthony Kenny (www.bl.uk).

Historians of twentieth-century Britain are fortunate; the archives of the BBC represent the largest collection of broadcast programmes in the world: some 450 million feet of film and some 500 000 video reels or cassettes. Alongside the BBC archive collections are the extensive holdings of the commercial television companies and numerous specialist repositories.[2] The range and quality of audiovisual sources seem overwhelming to most historians, especially medical historians who have yet to venture into this territory. Here, I want to highlight two very different examples of this range and quality. My first example is a series of ten half-hour programmes broadcast in 1958 by the BBC. This series, produced by Bill Duncalf and presented by Charles Fletcher, went out at 9.30p.m. Tuesday evenings and was entitled *Your Life in Their Hands* (YLITH). My second example is a 1974 film, sponsored by the Mental Health Film Council, produced by Kestrel Films, held and distributed by the Spastics Society (now SCOPE) and entitled *Like Other People*.

I decided to highlight these two productions for a number of reasons. Chronologically these examples fall within the period of my own research, the 1950s through to the 1970s.[3] In style and content they represent two very different images of medicine; one (YLITH) presents a high-technology, hospital-based image, whereas the other offers what may be described as the patients' perspective or a representation of patients' rights. Moreover, both productions were seen, at the time, as pushing the boundaries of what was suitable for a popular viewing audience. The first series of YLITH caused outrage amongst members of the medical profession by virtue of its ability to show real doctors, performing real operations on real patients.[4] In contrast, the film *Like Other People* offers a pre-cursor to what we would describe as a video diary. Here, a young couple, living with cerebral palsy and living in a care facility, claim their right to marriage and a sexual relationship. This film, which closes with intimate scenes of the young couple bathing and caressing each other, retains some of its capacity to shock – it is still rare to encounter such a frank portrayal of the issue of sexuality and disability.

These two productions also raise different concerns about preservation and access. To view the first series of YLITH you will have to negotiate access to the archive collections of the BBC, as our national repository the National Film and Television Archive (NFTA) does not hold viewing copies of this series (www.bfi.org.uk/home.htm). The NFTA has recently acquired a copy of *Like Other People*, as a good-quality print came to light last year when SCOPE moved premises and uncovered a number of old films

stored in the attic.[5] I will return to issues of preservation and access in a moment. First, however, I want to say something about the importance of building a historical sense of medicine and the media, especially audiovisual media.

I emphasize the need for a historical sense because I believe that scholarly interest in this material has been shaped primarily by sociological concerns, and that issues of context and change over time are somewhat sidelined in the ever-burgeoning literature on media studies. In order to locate and contextualize productions like YLITH and *Like Other People*, I believe that medical historians need to develop a dialogue with media historians.[6] To encourage this dialogue I want to suggest two important and inclusive themes that represent avenues of research into medical–media relations in post-war Britain. These themes can be described as inclusive because they appeal to medical and media historians, in that they seem to spark ideas and speak to established concerns within both communities. The first of these themes focuses on media content. Here, I suggest that we need to build a picture of how developing media genres, formats and broadcasting conventions have responded to the representational challenge of emerging medical issues and conceptual models. There is little doubt, for example, that a range of forms, such as advertising, news and current affairs, drama, documentary, studio discussion, chat shows and educational programmes have all offered different potentialities, at different times, in terms of what they can present and the way they can present it.

Recent work on British television coverage of HIV/AIDS highlights the important role of drama and educational programmes in offering a platform for perspectives not fully prosecuted in formats like news and current affairs, which aim to present a balance of views.[7] The popular portrayal of new health threats, new concepts and new scientific models of understanding, such as the post-war rise of epidemiology, are representational problems that journalists, producers and cameramen have had to address and re-address throughout this century. These are ongoing concerns, as the expanding field of risk communication indicates, but we have little knowledge about how communications of this sort have developed over time. For example, we lack a clear sense of how the media have handled the popular presentation of the concept of relative risk, a medical and media history which spans from the 1950s controversy over smoking and health, through to more recent concerns about food safety.

My second inclusive theme would help to support sustained historical work on media content by focusing on personal and organizational links between medicine and the media, and the development of what sociologists call source–media relationships. Such links are recent developments in the field of medicine, as public relations experts, press officers and specialist health and medical correspondents are largely a product of the post-war period. However, this community has come to constitute the key interface between medicine and the media. Medical and media historians need to work together to map the history of this community. We need to chart the varying fortunes of press and public relations as they operated in the relevant government departments, in medical professional organizations like the British Medical Association, in hospitals, research facilities, the pharmaceutical industry and a plethora of campaigning organizations. These sources and the relationships they forged with different aspects of the media have been decisive in shaping 'the image of medicine' in post-war Britain.

Obviously there is much work for medical and media historians to pursue in this area. However, to prosecute research along these lines requires ready access to a comprehensive collection of audiovisual sources, covering a wide range of formats (drama, documentary, news and current affairs) and the ability to contextualize these sources through a range of supporting material – scripts and other documents of production. Once again, the two example productions are different in this respect. There is a wealth of material surrounding the production of YLITH, located in the BBC's Written Archives at Caversham.[8] To date, however, I have been unable to locate material relating to the production of *Like Other People*. I am pleased to say that the importance of accessing supplementary material is clearly recognized in some of the important access initiatives concerning audiovisual material, and is a principle supported in the Kenny Report.

One important access initiative run by the British Universities Film and Video Council (BUFVC), and called the British Universities Newsreel Project (BUNP), has been busy computerizing the Slade Film History Register. When complete, this database will contain details of some 200 000 newsreel stories,

spanning the years 1910–1979. Details of individual stories are enhanced by the inclusion of a biographical index of newsreel editors and cameramen. Where available, this material has been further enhanced by the inclusion of photographs, newspaper reports and the written experiences of individual cameramen (www.bufvc.ac.uk/index.htm). A more technologically adventurous development is the Imagination/Universities Network Pilot Project, initiated by the BUFVC, the British Film Institute (BFI) and the Joint Information Systems Information Committee (JISC). This project works with two pilot sites – one operating from the Performing Arts Data Service in Glasgow (www.pads.ahds.ac.uk/ImaginationPilotProjectCollection) and the other from the University of Glamorgan (www.revelation.gla.ac.uk/) – to test and develop the delivery of moving images to academic institutions via computer networks. The Glasgow site holds around 30 hours of moving image material, drawn mainly from the BFI's NFTA. This material, which has been cleared for copyright and is accompanied by an array of supporting materials, covers the subject areas of film studies, social history and medicine. The potential of a development such as this was demonstrated at a BUFVC conference in Cambridge last year (17–18 December 1998). As one delegate expressed it, "It seemed easy until you realized that what we were seeing was the translation of computer data streamed across Britain into projected images, cinema-screen size, full motion, full colour. We saw the original script in the original font. We saw data relating to the film and we mouse-flicked through menus seeking bits and bobs as the moving pictures arrived at Cambridge in bits and bytes from Glasgow…This was moving pictures on the Net."[9]

Any historian who has tried to access and/or make use of archive television footage for teaching or research can readily understand the sense of excitement conveyed in these comments. Developments like the Imagination Project offer the potential for our audiovisual heritage to become a distributed resource. Securing the future of this heritage, however, is a problem that goes beyond technological solutions. At present it seems highly likely that audiovisual material will be brought within the system of legal deposit, which has secured much of our paper-based heritage, although the arguments surrounding this extension are somewhat confusing. With regard to audiovisual material, that is 'film and video', the Kenny Report proposed the following: that a system of legal deposit for this material should be as comprehensive and non-exclusive as for any other form of published material; that material selected for preservation should, where requested, be accompanied by a selection of related material (stills, posters, publicity material etc.). The system should also enable gaps to be filled in the existing archive by giving the repository the right to request access to known materials for the purpose of copying and preservation. Confusion arises, however, because the Report draws a distinction between 'film and video' and 'broadcast television'. The Report argues that broadcast television is covered by the off-air recording agreements operated by the BFI and BUFVC, despite the fact that these agreements are by no means comprehensive in their coverage of terrestrial broadcasting, and overlook cable and satellite broadcasts. According to the BFI, the exclusion of broadcast television (which is in essence 'film and video') threatens a huge and anomalous gap in the maintenance of an audiovisual national archive.

For any system of legal deposit to operate successfully with regard to broadcast television, archival and commercial interests will have to be accommodated. Copyright issues and the need to secure against unauthorized copying of a (digitally) distributed archive of this material will also have to be resolved. One thing is certain, whatever form the system of deposit eventually takes, its operation will require large investment – securing, copying, storing and distributing this vast resource. On a more personal and perhaps more fundamental level we, the academics, have to invest in using this material in our daily research and teaching activities. In the absence of any real demand for this material, legislative and technological developments are solutions in search of a problem.

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Why keep it at all? The clinician's viewpoint

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I spent four happy and productive months here at the Wellcome Institute for the History of Medicine as a Research Fellow. Today, I will give you a clinician's views, but better informed, I hope, by that experience and education.

First of all, I am going to tell you a story – a parable – about the princess who wanted the moon. She was the daughter of an extremely powerful emperor. She asked him if she could have an apple made of pure gold. He had an apple made of pure gold and gave it to her. She wanted a pony, the whitest pony that had ever been seen. A milk-white pony was found by scouring the land and it was brought to her. One day she said she wanted the moon. The Emperor went to the court astronomer and posed the question. "Sire, that is difficult because the moon is made of green cheese and three miles above the earth". So the Emperor went to the palace engineer who also thought it was a problem "because," he explained "what the court astronomer has told you is what we believe to be the case and even with my strongest cranes, I cannot bring it down". So the Emperor went to the court jester and he said "The princess wants the moon". "Leave it to me, sire, I'll go and have a word with her". So after, he read the princess her bedtime story and he said "Tell me about the moon". She said "The moon is made of silver". "Oh" said the jester, "How big is it?". "It's the size of my fingernail, look I can cover it with the tip of my finger". So he went to the court jeweller, who made a little silver moon, which she hung around her neck and she was content.

Doctors are rather like the princess and the Emperor. They go to engineers and technologists, and ask for the impossible. Picture the records department of one London hospital. If you ask the clinicians, someone will say "You just scan them all in, press the button, and get out anything you want". If you store your data electronically and retrieve it electronically that is possible, but scanning in a pile of notes, including handwritten material is simply not practical. We still hear "Just put it all on the computer, press the button, and the paper will write itself". Oh no it won't! So we have some very, very important choices to make.

The clinician amateur historian is interested in the firsts, the famous, the unique – but at the other end of the spectrum, are we really interested in the first or in what became standard? Or, is it of more importance to know what the unknown average doctor was doing? Are we interested in the one-off unique case, or in what was everyday practice? And in the case of data sets, do we want the richness of infinite detail, or parsimony? Can we possibly ever get the totality and if not, how do we sample? Should we just trust serendipity or should we have a plan? As far as clinical records are concerned, fat folders are fascinating to doctors, they are the interesting, difficult cases, but actually lots and lots of thin folders are of more relevance to the epidemiologist. So which way are we going to go?

I am now going to touch upon some of the different types of archives.

Firstly, the Minutes of the Medical Committee of Guy's Hospital in May 1947, which are to be found in the Greater London Records Office. We see that Mr Slessinger entertained the Medical Committee in his house in Devonshire Place, W1, a very strange place for the Guy's Hospital Medical Committee to meet, at 8.30p.m. on the 15 May. There is a little fragment of history here. When you put away your archives, you have no idea what question is going to be asked 50, 100, or 150 years later, and you have no way of knowing. Years later what you think is novel might be so commonplace that it is of no consequence, but on the other hand, there may be something which you take as routine and which will be remarkable to people when they come along some years later.

It was reported to the meeting that the Board of Governors had agreed that Johns Hopkins Hospital staff selected to visit Guy's Hospital would get associate consultant status. Alfred Blaylock, famous for a particular operation in congenital heart disease, came and performed operations in Guy's while Sir

Russell Brock went to the USA, performed close mitral valvotomies and taught the surgeons there how to do it. I then made the serendipitous finding of a photograph in the *Guy's Magazine,* and the contemporaneous minutes of the Medical Committee corroborating it.

The other thing I came across in a serendipitous fashion is a little book. In April 1948, Brock formed a club. Just as he was collaborating with people from America, he was also setting up this club to which he invited a whole range of people who might be able to support him in his desire to perform new operations such as mitral valvotomy. Here is some of the handwritten record from the book. Campbell was a physician who decided at around this time that he was going to be a cardiologist. This is a marker in history. We now recognize there are specialists versus generalists, but he was a general physician who, as early as that, decided the time had come to be brave enough to call himself a cardiologist. This was an important change in practice. The meeting was closed at 11.15p.m. with a vote of thanks to Dr Campbell for the excellent dinner at The George. So we also find out how these men led their lives, how they networked, how they conducted things, how they built up their practice. It is corroborated because in 1947 Slessinger moved from his house to a flat. He is in the chair and they agreed that the Thoracic Surgical Unit should be formed and housed in Guy's Hospital, the number of beds and so on. Absence of either one of these documents would leave us short of the full picture: one gives rather official details from the hospital, the other is very personal and handwritten. What is interesting is that these notes are rather brief, and nowadays, with the electronic medium, we write much longer minutes. So who's going to store those and what are we going to do about them? I have no answer, I only ask the question.

Another source of interesting information is oral history. There is a very interesting piece of oral history that goes round about Soutar in the 1920s, and about Brock in Guy's Hospital in the 1940s. I also heard a new one about Edinburgh where people often described the origins of this sort of surgery as a complete blood bath, with patients dying in their hundreds. It wasn't actually true, and if three patients in a row died people tended to back off a bit, until things got better. So, the oral history seemed to me to be flawed. Where it is of interest is where it enriches something that is substantiated and for which we have data in our archives, and I think the two must live side by side.

Now, here is the sort of record that is very hard to know what to do with. It is a pile of cards from 1953 that I have inherited from my predecessor, who inherited them from his. The cards record every closed mitral valvotomy that this surgeon ever did. He recorded every visit, and everything he heard: the murmurs, the clicks, the opening snaps and so on. Is it of any scientific worth? Is it worth keeping so that we learn something about rheumatic heart disease or mitral stenosis? Personally, I doubt it in this case, because so much else was available and thoroughly documented. But I wouldn't lightly discard it. There was a slide about Iceland earlier today, which I suspect illustrated a similar example to Barker and his philosophy on the fetal origins of cardiac disease: Barker found the midwives' records from 60 and 70 years ago, documenting the birth weight, rate of growth, and so on, from which he was able to come up with a very important epidemiological hypothesis that babies hungry in the uterus got hungry pancreases which set the scene for serious cardiac disease 50 years later, because they were too good at storing lipids. An interesting theory and one which is promulgated all over the place, but it is one of the few examples where storing these types of records adds to scientific knowledge. In the main, I think we get our scientific knowledge from other sources, but we have to bear in mind the choices that we have to make. Do we store all of this stuff in case it gives us additional information, or are we much more parsimonious?

Another example is archives about hospitals. There is a big plastic surgery unit closing at the moment. Do we keep all the records from the First World War era of the birth of plastic surgery or not? Or would it be of more importance to keep the minutes of the Medical Committee or the Treasurer's notes? It is hard to say. In our examples from 1949 we can see a debate going on about clinical practice. Brock is going to be away, and he wasn't at this meeting. It was agreed that Sir Heneage Ogilvey, a surgeon at Guy's, be asked to take charge of the Thoracic Unit during Mr Brock's absence, and a letter be sent to Mr Brock. We don't have a copy of the letter, but he reversed the decision pretty quickly. It is quite clear that he is not having Sir Heneage Ogilvey looking after his cases. Slessinger can take nominal control, but Mr Tubbs, who worked at Bart's, suggests that a surgeon from Bart's covers the Guy's cases. So, here is an interesting statement about clinical practice, what specialists regard as safe, and who they would trust with their cases in their absence. But, I couldn't honestly suggest that we should store lots of Medical

Committee records in case 50 years later somebody will pick on a nugget which happens to amuse them, or for that matter, even teach them something about how doctors behave, how hospitals are run and how we govern our practice.

To continue with mitral stenosis, which happens to provide this link through, Brock is here ready to teach about mitral stenosis, its relief and its impact on the patient. Curiously, this type of operation faded away when bypass came along, and has come back again with the balloon interventions and percutaneous catheter-delivered systems, but cardiologists cite no references earlier than about mid-1970s. Perhaps because that is when they first get their *Index Medicus* and their MedLine search done. It is interesting that they have discounted all of the knowledge gained by surgeons in those eras, but I can't say that you should force everybody to read literature from 50 years ago.

Because by 1952 Brock had written up a series of 100 cases and by the late 50s, there were a thousand, it becomes clear that surgeons collecting their 30 or 40 cases here or there is not of any great scientific relevance. So the obsession with keeping everything all the time is clearly misplaced and there has to be a point at which things must be discarded and forgotten. More interesting is a little snapshot of an individual who had decided he was going to be a cardiologist and a listing of the mix of congenital heart disease that he was seeing at the time, because from data of this type we can calculate the natural history of the disease in which we now always intervene, and if you always intervene you never really know whether you are influencing the long-term survival or not. This would be an area in which old archive documents are of some interest.

Back to the little book, we find the name of Doris Diggins who was one of Brock's patients, and it was the first mitral stenosis. But of more interest is where they talk about saving the heart, inviting the heart hospital staff and showing the specimens. Keeping pathological material has for years been the tradition among surgeons and doctors. Even Frank Dobson knew that we held onto appendices. This was quite standard and widely accepted, and yet it has only now been revealed and people seem to be horrified by it, much to the surprise of the doctors.

To move back again, this is another interesting little fragment of history. It is Mr Slessinger's flat again, and after considering a proposal from Dr Douthwaite that in the light of the National Health Service control of the hospital, the matter of the time and place of the Medical Subcommittee meetings should be considered, it was agreed that no alteration in the present arrangement should be made.

Now, the reality is that the Royal College of Surgeons, the Wellcome Trust and a number of other places, receive lots of people's papers, well ordered or not, important or not. Amongst them you find the famous, for example a lady operated on by Mr Spencer Wells, whose name is now used as the generic name for the artery forceps. Do we mind what Spencer Wells was doing in 1877? Does it make any difference to practice? Are we interested in it, other than that he has become very famous because he named a pair of forceps? There is a hobby amongst doctors of going back and re-diagnosing, but it seems to me to be just like saying that the moon is not made of green cheese. When the princess wanted it, the fact that it was three miles away and made of green cheese was quite good enough for the purpose at the time and may be of more relevance than knowing what we know about it now. But such things do add great richness, and I am not sure whether you let it come by serendipity or by sampling or by some other mechanism. I do not have a strong view, but I put it to you that you have a choice to make. We hope that we are able to store at least some of our records, and that they have been carefully looked through by an archivist, researched by somebody and put away so that they are available, but it is impossible to do that with everything. Money matters and it has mattered for a long time. In September 1948, for instance, in-patient costs at Guy's Hospital were too high, higher than in all other hospitals, and the Ministry of Health was concerned. The issues of funding are enormous and a decision has to be made on how much of our pool of money is going to be given to archiving, how much to new operations, how much to epidemiological research and so on. There will be a budget available and between us, and in discussions such as these between archivists, librarians, database managers, computer experts and so on, we shall have to decide what can be done. But my own view is that there is not one answer. I am sure that people here have a diversity of solutions and that is probably the best way. And between us we will all save something which will give richness and amusement, and interest and insight into our times to those who come after us.

Why keep it? Throw it in the 'dustbin of history'[1]

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The expression 'the dustbin of history' was coined by Leon Trotsky who used the expression, in his *History of the Russian Revolution*, of his political opponents, the Mensheviks to indicate that the ignominy of the dustbin was their proper place, they would have no recognition in the history of the Russian revolution.[2] Little did he realize that soon, he too, would be consigned to the dustbin of history, as the Soviet propaganda machine set about rewriting the history of the Russian revolution, rigorously excluding Trotsky's part in it. There are several important issues that are raised here (and by the illustrated slides accompanying this section) about the use and manipulation of sources and the writing of history. However, my purpose today is simply to introduce the term 'the dustbin of history' and to propose that we must be prepared to put into that dustbin many of the records of contemporary medicine so that a manageable amount remains for use by present and future medical historians.

Of course medical historians are not alone in being faced by ever-increasing numbers of records and ever-increasing arrays of formats. A J P Taylor once famously commented that "…history gets thicker as it approaches the present time. More evidence is preserved," he wrote, "one is tempted to say too much is preserved, and decay and destruction have hardly begun their beneficent work".[3] But historians of medicine and medical sciences have particular problems. As we have already heard from other speakers today, it has been reckoned that the medical literature doubles between every 15 and 20 years. We have also heard today of some of the subsequent problems of this growth for archivists and librarians. The consequences for historians are equally horrendous. We have already had some mind-numbing statistics and I am going to add a few more, and I must stress that I am doing so from my particular perspective as a historian of modern medical science.

Estimates vary as to how many scientists there are alive today. A survey undertaken by the Institute of Scientific Information some years ago concluded that between 80 and 90 per cent of all the scientists there ever have been are alive and working today. It is what emerges from those scientists, the products of the lab, that concern us. Put simply, more and more scientists are writing more and more articles for more and more journals. Again, the Institute of Scientific Information has estimated that about 80 per cent of all scientific information passes through scientific journals. So, for contemporary medical scientists and for historians of recent medical science, journals are key sources of information. There are various ways in which the explosion of journal articles can be measured. One is to look at *Index Medicus*, a key major indexing tool in biomedical literature. A crude but pretty effective way of measuring its increase is to weigh the volumes. The hard copies between 1879 and the 1940s maintain their weight at about 2 kilos a year, but in the intervening years there's a massive explosion and, in 1978, one year's worth of *Index Medicus* weighed 14 kilos. That was despite the fact that it was printed on thinner paper, it was soft bound, it had narrower margins and a smaller typeface.[4] Its electronic counterpart MedLine currently abstracts titles from nearly 4000 journals in 40 different languages. Over 7000 references are added to its database every week, that is, over 400 000 references every year. Looking at my own particular field, physiology, measuring the volumes of the *Journal of Physiology* on the bookshelves in my office reveals the following:

Journal of Physiology

1878–1977	285 volumes	15 m of shelves	(0.15 m year^{-1})
1978–1987	120 volumes	7 m	(0.7 m year^{-1})
1988–1993	64 volumes	4 m	(0.8 m year^{-1})

Between 1978 and 1987, 120 volumes appeared and they occupied almost half the space taken by the volumes of the entire previous century. The trend was obviously continuing over the next five year[s] and it will come as no surprise to you to realize that, in 1994, I decided that my bookshelves could no longer

afford a subscription to the *Journal of Physiology*.

So we have here the well-known story, more scientists, more journals, more papers and even a higher score on the WIMPI scale. WIMPI stands for Words in Mean Paper Index, and this is a result of a survey taken in 1984, analysing the words per paper in a variety of American, British, and Japanese biomedical journals.

WIMPI

1910–1940	100 WIMPI
1950	108 WIMPI
1980	300 WIMPI

(*Source*: Trimble, 1984)[5]

It shows that by 1980 there were almost three times as many words per paper than there had been only 30 years earlier.

So how on earth does one keep up? Well, George Lundberg, the sadly former editor of the *Journal of the American Medical Association* [JAMA], has suggested that 2 million biomedical articles appear each year, and has produced two strategies for how to deal with them. One is that you can read two articles per day, but unfortunately at the end of the year, you've got 60 centuries' worth of reading to catch up on. And the other alternative is to read 6000 articles per day.[6] Well, clearly, we are in danger of suffering from a new variant form of bibliochlothanasia, death from overcrowding by books, first described over 20 years ago by B J Enright, whose views on paperless libraries and other facilities we have already heard today.[7]

But there is help at hand, we don't have to die from overcrowding by books and that depends on the phenomenon known as clustering. A survey in the late 1970s looked at all the literature produced on schistosomiasis in the previous 110 years, as summarized in the next slide.

Schistosomiasis

110 years – 1738 journals
33% of literature – 19 journals
50% of literature – 50 journals
(*Source*: Warren and Goffman, 1978)[8]

There were over 10 000 citations, appearing in over 1700 journals. The close analysis of those papers showed that 33 per cent of those articles appeared in just 19 journals and a full 50 per cent of the literature appeared in 50 journals.

A similar survey was undertaken to look at literature on mast cells, as shown below.

Mast cells

86 years – 587 journals
25% of literature – 20 journals
50% of literature – 78 journals
(*Source*: Goffman and Warren, 1980)[9]

And again, there were nearly 3000 articles appearing in just over 580 journals over a period of 86 years. Again, there was a clear clustering effect and over 50 per cent of the literature appeared in 78 journals.

So a practising scientist or clinician has some guidelines as to which are the critical core journals that should be read or scanned on a regular basis and if supplemented by an appropriate indexing or abstracting journal, they can be reasonably confident that they are covering most of their field.[10]

But what about the poor historian? Paradoxically, historians do not want to read just the main papers by

the leading authors. Someone like myself also wants access to private papers, to laboratory records, in whatever form they survive and, of course, we also need the machines on which to read those laboratory records. I also need to see photographs and other visual material. I would like to find equipment and I also want the records of all the other people involved in laboratory research, not just the prolific or the well-known authors, but all the other laboratory personnel as well.

So how does material survive for the historian to use? Well, I want to suggest, and this is by no means an exhaustive list, that there are four basic ways, roughly analogous to biological mechanisms, that have been associated with the ways records have survived in the past and the present time.

First of all we have got Darwinian survival, the survival of the fittest records and in this sense I mean mainly official records, state papers, papers from central and local government, and ecclesiastical records. These are papers that have been preserved for centuries, because they are deemed to be highly significant and important for our national heritage. But for historians of the recent period, these sort of papers provide considerable difficulties, most especially in Britain because of access requirements. Most public records are governed by the 30-year access rule, clinical records certainly have longer closures, usually 100 years, as do certain other designated papers. So the Darwinian survival of records, of public records, can provide difficulties for historians of the recent past.

Another approach we can call eugenic survival, of deliberate positive selection policies to encourage the survival of records. Here, I include the institutions, organizations, or even individuals, who encourage or are encouraged for a variety of different reasons to preserve records. I am thinking for example of organizations such as the Royal Society or some of the collections that are now housed here in the Contemporary Medical Archives Centre.

These two mechanisms, Darwinian and eugenic survival, do of course provide a bias towards the records of the great and the good. We all know that by and large it is the records of both the victors and the survivors that we keep, but on the whole these mechanisms have served historians reasonably well. They have provided an adequate range and a mountain of material that has allowed scholars to address serious historical interests and the historians' traditional skills of reconstruction and interpretation have allowed the gaps to be filled. But, as I have already suggested, these mechanisms provide particular difficulties for historians of the recent past, especially the access restrictions on both public and indeed on some private records, or the very fact that relevant records have not yet or indeed may never be deposited in a suitable repository.

And this brings me on to a third mechanism of survival I want to propose, opportunistic survival. This is what a colleague, Virginia Berridge, a historian of contemporary medicine has called 'archives on the run'.[11] These are the archives we find in the course of our work. Those of us who work in the recent past frequently have to interview witnesses and participants about specific events, simply because their papers and documents haven't survived either according to Darwinian or eugenic principles. Often in the course of interviews we learn of documents that individuals have kept. The minutes of meetings that we're not permitted to see in the Public Records Office, or correspondence and photographs gathering dust at the back of desks. Often the owners, and their families, are astounded that historians are interested in such material. They are usually most generous in allowing us to borrow or to keep material and they are usually quite happy for deposit arrangements to be made with suitable repositories. Those of us who work in this period are constantly alert to the possibility of caches of documents surviving in hidden places, and we seek them out and use them wherever we can.

In contrast to all that has gone before, my fourth category, pathological or carcinogenic survival, sounds somewhat contradictory to what I have just said. This is not a question of searching around in hidden places for material, but recognition of the massive uncontrolled proliferation of information. A cancer of records is threatening to swamp late twentieth-century medicine and inevitably the history of the period. As we have heard and know, clinicians and scientists have been experiencing this explosion for some years and it is only now beginning to register more widely in the historical community. I think there is a very real danger that historians of recent medicine are drowning in a sea of records whilst desperately searching for relevant material and clearly we need to do something.

Here I am going to be repeating some of what's already been said by other speakers this morning. One immediate suggestion is to have acquisition/retention consortia, so that libraries within a designated consortium will collect limited numbers of titles or particular subjects, thus allowing others within the consortium to discard their duplicate, triplicate or even other multiple copies. So within a specific consortium several titles are preserved, but only one copy of each somewhere within the consortium. We want to avoid the kind of situation that exists in many parts of the country. Indeed in this part of north London, within walking distance of this library, there are several other libraries all preserving the same volumes, or similar volumes, of a limited number of titles. Clearly an important component of this sort of scheme would be that access would be allowed by all libraries to all members of all the other libraries in the scheme. As a user, I would like to suggest that all medical libraries should actively seek to set up and belong to such consortia.

The second suggestion I'd like to make is to increase electronic access to records. We heard this morning from Jeremy Wyatt about capturing electronic records of contemporary medicine, but what about records already in archives? There are a number of initiatives underway to digitize archives into online accessible records and I'd like to mention just one site that I found a couple of weeks ago. This is the Library of Congress which is actually funding the digitization of a number of primary sources and I examined just one of their collections – the papers of Alexander Graham Bell. The site allows one a number of fairly sophisticated search techniques, you can browse by key words, or by series, or by subjects, very quickly get into detailed handlists, catalogues, and indices, and then you can actually get into the documents themselves. These projects are undoubtedly expensive, but they do reduce wear and tear on the originals, they certainly facilitate access by scholars all around the world, although I am aware that issues of access and copyright might affect the ways in which historians of the recent past could use such resources.

My next suggestion takes me back to biology and to the concept of apoptosis. Apoptosis is programmed cell death. It's a process by which normal cells can grow and differentiate because other cells are programmed to die. When apoptosis goes wrong, if it fails for some reason, the cells that are programmed to die, remain alive, they replicate, and you get uncontrolled cancerous growth. This kind of cancerous growth is taking over the records of late twentieth-century medicine. I believe we need to translate this biological principle, programmed cell death, into programmed record removal. We cannot keep everything, and indeed if everything was kept there would be few, if any, historians who would venture into the overwhelming mountains of archival records that would survive. But someone, somewhere, has to make that decision to discard material. I don't think that the responsibility can lie with librarians and archivists alone. Historians and the historical actors themselves, in our case that includes medical practitioners, scientists, patients, journalists and others, could all usefully have a say in what survives into the future and also usefully share the responsibility for what is destroyed. Clearly mistakes will be made, but I think it would be an even bigger mistake if we don't undertake some regular review and dispersal of material.

And finally, I am going to suggest something that sounds contradictory. That is the creation of new records. I believe very firmly that the historical players themselves should be brought into the frame, they should be encouraged to write, or to otherwise provide with techniques like oral history, either individually or in groups, accounts of their own lives, their achievements, and their failures, both as condensed resources in their own right, but particularly as guides for the rest of us, the historians, archivists, and librarians, who have to deal with the mass of material that remains.

So, to summarize. Four suggestions that might help us provide a healthy heritage:

acquisitions/retention consortia – to avoid unnecessary duplication;
access electronically – if at all possible;
apoptosis – the removal and dispersal of records;
new alliances – between historians, librarians, and the historical actors themselves.

But perhaps we worry too much? I want to finish with a poem contrasting how historical research would be done in an earlier period with how that research might be done if Daphne and Chloe had lived today.

Some seven years I worried over
The brief letter from Daphne to Chloe,
For this was all I knew of them:
And from those few papyrus words I learnt
The agony of the dying lover.

If they had lived today then I must
Have sought their laundry bills and bank accounts,
The diaries of their friends and a school photograph;
But should I then have known them better
Than those whose lips have long been dust?[12]

That provides a cautionary tale and reminds us that the dustbin of history could be a very useful instrument to use in our efforts to collect sources for a healthy heritage.

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'The challenge of preservation'

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Introduction

This paper gives an overview of conservation and preservation issues of late twentieth-century materials. It addresses the preservation challenges, summarizes current solutions, indicates best practice, mentions who is working on what and what areas are not resolved. The first half deals largely with traditional collections, the second half concentrates on digital material.

Firstly, what are late twentieth-century materials in collections? Are they all binary? Has the much heralded death of the book happened? Are all journals now in electronic form only? Do we have the paperless office? No.

The paperless office is largely a myth. It was reported, in October's edition of *Prospect* magazine, that in offices which introduce e-mail, the amount of paper consumed goes *up* by 40 per cent. It is a fallacy that new media are leading directly to the demise of the physical book. On the contrary, there has been an explosion in printing and publishing, and one only has to go into any bookshop to see the expansion in the numbers and forms of books as physical objects. In one of the exhibition galleries at the British Library, there is a touch-screen questionnaire that asks "How long do you think the book will last?" and the choice of 10, 20, 50 or 100 years. The most popular answer is currently 50 years. It is a fallacy that one medium is completely supplanting the other. They are different. They do different things. In some areas, such as scientific journals and conference papers, there are indeed some titles which only appear in electronic formats, but often there are parallel paper and electronic forms. As yet one has not completely supplanted the previous one.

Therefore one characteristic of late twentieth-century material is its sheer volume, and another characteristic is its diversity, its multiplicity of forms and multiple formats. The following categories are taken from the *Report of the Working Party on Legal Deposit*.[1] This is a summary of current published material types, leaving aside archive and manuscript material which might already be in collections, such as parchment codices or papyrus rolls.

Print material
> volumes
> serials

Non-print material
> microforms
> sound recordings
> audiovisual material – films and videos

Electronic
> electronic books and multimedia publications
> electronic journals
> databases
> Internet documents

Publication medium
> offline, hand held, portable media
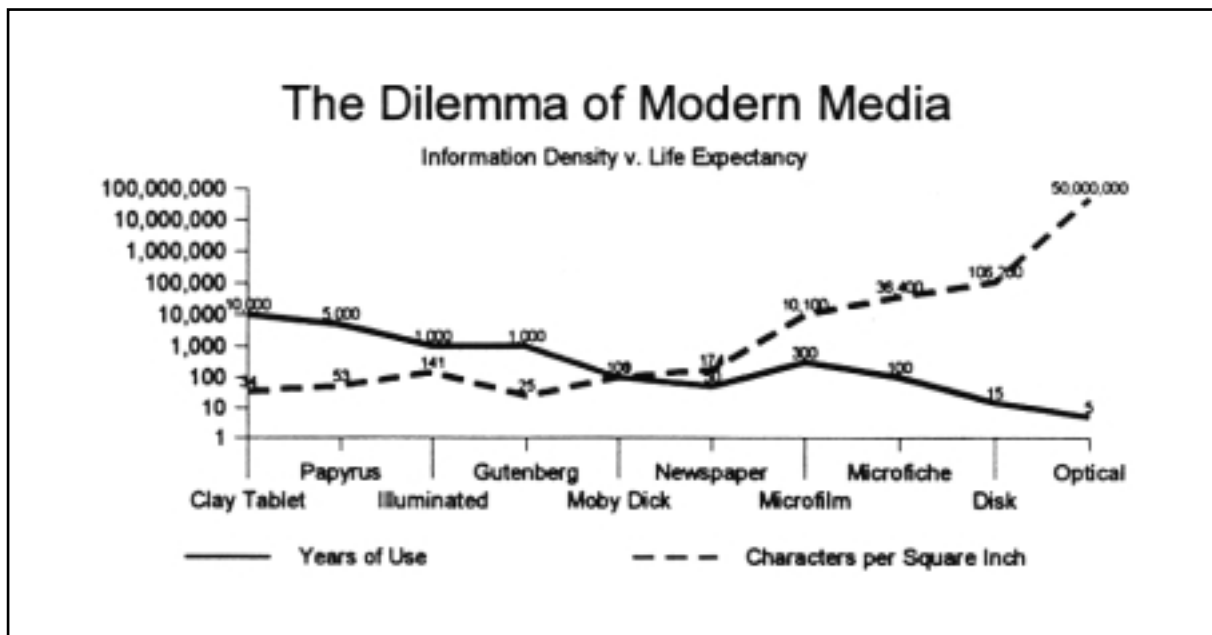> online media
> parallel publications

Figure 1
The Dilemma of Modern Media, in *Preservation in the Digital World* by Paul Conway, 1996.
Graph reproduced by kind permission of the Commission on Preservation and Access.

Consequently, diversity is a characteristic of late twentieth-century collections, but anticipated lifespan is where the media diverge.

A graph (Figure 1) produced by the Commission on Preservation and Access,[2] plots information density against projected life expectancy. Clay tablets (on the left) had very little writing on them, a mere 34 characters to the square inch, but they have lasted 10 000 years. The graph then swings through papyrus, illuminated manuscripts, the Gutenberg Bible, to newspapers and microform to the optical disc (on the far right). The optical disc contains 50 million characters to the square inch and has a life expectancy of just five years. This divergence in information density versus projected life expectancy goes towards explaining the urgency felt in the preservation of the new media.

However, whatever the media of the collections to be preserved the fundamental decision-making and options are the same. In most collections of information, whether in an institutional library or a doctor's surgery office, everything simply cannot be conserved to the highest standards, usually on straightforward economic grounds. Therefore, decisions have to be made about what to keep. But then decisions have to be made about what to do to what is going to be kept. There are different options, depending on the type of material, from 'do nothing' to minimum intervention (for example put it in a box) to surrogacy (such as microfilm it) to full-scale, highly skilled conservation treatments.

Before making those decisions, the overall state of the collection needs to be known. There are several survey methodologies around to quantify the preservation needs of a collection (some adapting epidemiological methods), but one very useful survey method is currently being developed by the National Preservation Office (NPO). In 15 questions this 'Preservation Needs Assessment' will identify the preservation priorities for any given size of collection by looking at 400 samples to give a 95 per cent confidence in the level of accuracy.[3] This method is being developed as a strand of the national preservation strategy for libraries and archives in the UK, which is a major part of the NPO's remit[4].

This methodology is a way of looking at all the preservation needs of a collection, looking at the well-being or otherwise of the whole population of a collection. As with the health of a nation, everyone is never going to be in perfect health, as some people have inherited genetic conditions. So it is with the health of a library or archive collection, in that some items are inherently unstable. For example post-1851 so-called 'brittle paper'; the very stock from which the mechanical woodpulp paper was made and its manufacturing method make it inherently unstable. The 'brittle paper' issue is a major problem and there have been many attempts

to address it, including 'mass' deacidification treatments. These attempt to neutralize the acidity and introduce buffers against future acidity. For example, the Library of Congress pursued diethyl zinc, the National Archives in Canada amongst others use Wei T'o's methyl methoxy magnesium carbonate and the Bibliothèque Nationale is pursuing super-critical CO_2. The Bookkeeper process, using magnesium oxide, is an interesting development. There is a plant in Holland and, possibly, there will be a plant in this country. However, it is generally recognized that none is a panacea and none strengthens the paper.

Secondly, there will never be perfect health in a given population of people, because it is naturally ageing. So with a library or archive collection; the contents are actively deteriorating and the fundamental laws of nature, such as entropy, cannot be arrested. But the rate of deterioration can be slowed down by means of environmental control of temperature, humidity, light levels, particulate filtration etc. There is currently a lot of discussion in conservation circles about the parameters of temperature and humidity for paper-based collections, but for the moment at least, the British Library is recommending the revised version of the British Standard 5454 as best practice.[5] This covers paper, parchment, magnetic media, still and cinematographic film, microfilm and gramophone records.

On a macroenvironmental level, as a very rough rule of thumb, a 10°C increase in the temperature doubles the rate of deterioration for organic, cellulose-based materials. In the area of microenvironments, into which individual items in a collection may be stored, there are interesting developments in boxes. They are not just being made out of acid-free board but there is now also a material (Microchamber) which absorbs pollutant offgassing.

Thirdly, there will never be perfect health in a given population, because some people will abuse themselves, for example by smoking; moreover people are not static and they are subject to risk, such as being run over by the proverbial bus. So with a library and archive collection: it is being used, sometimes abused (leaves being torn out), it is being handled, it is being photocopied, it is subject to mechanical wear and tear by readers. Minimizing risks from mechanical as opposed to chemical sources, can be wrought by using book cradles, instigating and maintaining good handling regimes etc. There are many sources of best practice in these areas of preventive conservation, but one very useful approach, which was not developed for libraries and archives but for museums seeking designated status, is the Museums and Galleries Commission *Levels of Collection Care,* which defines 'basic', 'good' and 'best' practice.[6]

Once a collection has been surveyed, and knowing that everything cannot be conserved in a pristine condition, the preservation decision-making can be seen as analogous to triage. The choice has to be made to 'patch up' and give only first aid treatment to some items and send them back to the front line of the reading room; accept some items are beyond repair and carry out major surgery on others, depending on their future usage. A useful matrix for this decision-making is: value, use, condition.

'Value' or importance can be defined in the context of any particular collection. Take, for example, in the field of medicine a treatise on frozen shoulder. If it is the latest research in last week's journal, the information content is the most important thing to the reader. The physical format, whether paper, microform, photocopy, electronic is irrelevant. But at the other end of the spectrum, if that treatise on frozen shoulder is by Leonardo da Vinci, written in mirror writing with exquisite line drawings and in the original Renaissance limp vellum binding, then that codex has an enormous artefactual value. It is more than the sum of the individual parts of straightforward information contained on the page. These factors have to be taken into account when setting priorities and deciding appropriate treatments.

The second part of this paper concentrates on the challenges of preserving that specifically very late twentieth-century medium, digital material. It is very early days, probably comparable to the early days of video, when it was unknown whether Betamax or VHF would emerge as industry-standard or the early days of satellite TV before Sky proved pre-eminent. So it is with digital standards. As to the preservation of digital material, it is probably similar to the early days of microfilm, not even at the stage of silver halide film and well before the formulation of such things as the Mellon Microfilming Guidelines.

It is not only comparatively early days, but we are in a transitional phase, and things are in flux. Even the terminology keeps changing, so what was called 'post-hoc digital rescue' yesterday is 'digital archaeology'

today. This is a difficult, complex, fast-changing area and largely unknown territory.

However, many people in many different disciplines are heeding the warning bells and are asking the same questions about how this material is to be preserved. A lot of work on guidelines, and standards and policies is being done and starting to bear fruit. Generally, however, there is a lack of proven standards and proven protocols in this area of preserving digital material.

The fact that many different people in different disciplines are involved in managing and attempting to preserve digital material highlights another point, that this is essentially a distributed process and a cooperative process. It does not simply rest with curators, librarians, archivists or IT professionals or conservators. And the preservation solution does not have to reside physically within an institution or collection. For example, the digitization of the Beowulf Manuscript is stored, not at the British Library but at the University of London Computing Centre.

Another characteristic of digital material is that preservation and access are very intimately tied up, even more so than with other media. For the moment, the British Library does not regard digitization as a preservation tool, rather as an access tool with possible preservation dividends.[7] This is due to uncertainty about the long-term implications of digital preservation. The preferred method of surrogacy for preservation purposes is still microform, since archival-quality microfilm is projected as having a lifespan of 300 years.

The issues surrounding the preservation of digital material can be divided into hardware, software and the physical carrier such as floppy disk or CD-ROM. Each has different preservation implications and different preservation options. The preservation implications of hardware and software are intimately linked. There is the issue of technological obsolescence. Currently, "devices, processes and software for recording and storing information are being replaced with new products and methods on a regular three-to five-year cycle, driven primarily by market forces".[8] There may well not be the hardware on which to run the software.

Technology preservation has been mooted as one solution which is basically conserving computers. This concept is probably a non-starter and may well reside more in the remit of the Science Museum than anywhere else. There is a Computer Conservation Society in the UK and the industry-funded National Media Store in the USA, but generally conserving every type of hardware is regarded as the least probable option.

For the information content of the software, the current preservation options are some form of copying, either refreshing or emulating the information, or migrating it. Terminology is evolving in this area, but 'refreshing' is making a copy like making a back-up copy; emulation, "relies on a robust system for preserving the metadata which describes the technical environment - nothing is done to the original…and it is the environment which is re-created"[9] and a good definition of migration is "a set of organized tasks designed to achieve the periodic transfer of digital materials from one hardware/software configuration to another, or from one generation of computer technology to a future generation"[10]. This last strategy of migration is what "many libraries and archives are involved in and many believe…is the most practical approach".[11]

As to the physical medium, when CDs were first introduced, they were heralded as being indestructible compared to vinyl records, but they do degrade. For example there are reports of delamination, although the physical degradation mechanism is not yet fully defined. They have been found to be sensitive to strong sunlight, especially UV [ultra-violet light]; pock marks in the acrylic can lead to deterioration of the surface with aluminium or silver oxide being formed and the dyes are an issue. Anecdotally, they have been described as being as stable as thermal fax paper. Careful environmental control and careful handling are necessary if the original, physical thing is to be kept.

Other issues to be considered concern how the digital material was created. Digital material is either 'born digital' or digitized. 'Born digital' means that it has only ever existed in electronic form and there is no version in any other medium. 'Digitized' means that something which already existed in analogue form, such as an illuminated manuscript leaf or a photograph or a journal, has been converted to digital form. The

preservation implication is that in the latter case, the original still exists, probably in a more stable medium.

From a preservation point of view, involvement at the point of creation is proving vital. It is becoming clear that decisions taken at the beginning of a project, for example about the metadata (that is the data about the data), affect the storage and the migration possibilities, and the later costs. One point to emphasise is the huge costs of 'post-hoc digital rescue' if the long term storage and access implications have not been incorporated at the start.

A further major, complicating factor, is whether the information is static or dynamic. If it is dynamic, is it interactive, continuously being changed or does it have dynamic links to other information. Why is this a major issue? Because one might think if there is so much uncertainty about how to preserve digital material, then a paper copy could be printed off and kept. Paper, having been the villain of the piece in the light of brittle paper, is ironically emerging as a comparatively more stable medium. Although there are doubts about the longevity of many papers with additives, such as extenders, and about recycled paper, nevertheless archival-quality paper is projected to last 100 years. But if there are dynamic links to other information, how can printing a paper copy be the solution? Or if something is continuously being changed, at what point should it be printed off – daily? hourly? There is an interesting Swedish project experimenting with this issue, called Kulturarw.[3] This is a web archiving project, which uses robots to identify and download all Swedish web pages.[12] It is capturing that most dynamic of phenomenon, the Internet, and it is testing storage protocols for preserving everything with a Swedish web address. It is producing some interesting information, for example, the average life of a web publication is two months and the big problem is proving to be not the size but the large number of formats – at least 100 different file formats (although 95 per cent are in standard formats).

Conclusion

There are many issues in the area of digital preservation and much remains unresolved. There is a mass of information (one problem is to filter the information) and many people are addressing the issues.[13]

There are a vast number of challenges for the preservation of late twentieth-century materials. Vulnerable media, ranging from photographs to brittle paper, from cellulose acetate to thermal fax paper have been identified and addressed to a lesser or greater degree, but the sheer scale of the 'information age' is a major challenge. For example, it has been estimated that since 1945, a hundred times more information has been created than in the whole history of the world up to that point. In addition the scale and speed of digital material is a major challenge. For example, the number of publishers switching to digital publications is thought to be such that the quantity of electronic publications available globally is likely to more than double in the next five years.

There is a vast array of technological challenges for the preservation of late twentieth-century library and archive materials, but one of the intellectual and management challenges is to ensure the balance between preserving traditional materials and digital materials, and not be over-swayed by the undoubted urgency of digital material into forgetting the analogue collections.

The British Library, for example, is acquiring digital material from voluntary legal deposit; Ordnance Survey maps and patents are to be produced in digital format; and the library is creating thousands of digital images itself. But the 18 million volumes, 115 million single items and 40 million patents have not and will not all go away, so one of the biggest challenges is to achieve a balance of resource allocation between the preservation of traditional and digital materials.

To summarize this point, about a year ago there was a newspaper report illustrating the diverse developments going on in electronic documents, with a move to electronic government, exemplified by electronic red boxes. Recently, there was the headline 'Ministers defeated by new hi-tech red boxes'. The electronic red boxes have been abandoned and they are returning to paper.

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Research Libraries Group www.rlg.org/preserv. *RLG Diginews*, articles and reports www.thames.rlg.org/preserv/diginews

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National Library of Australia www.nla.au/padi

The collection and retention policies of medical libraries today

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This presentation on collection and retention policies, concentrates on UK medical libraries. Issues including: what is being collected, who is keeping what, and how long they are keeping it for, are covered in outline. The libraries featured are put into some broad groupings and some similarities in their approaches are identified. Inter-library cooperation is discussed and some of the policies and practices of today that are likely to have the most impact on future generations are described.

Introduction

The Long Now Foundation was established in 1996 by American computer scientists like Danny Hillis, who works for the Disney Corporation, futurologists like Stewart Brand, who writes for *Wired* Magazine, and artists like Brian Eno, the British musician and theorist.[1] The Foundation is concerned that progress is almost always measured on a 'faster/cheaper' scale and wants to promote 'slower/better' thinking.[2] Long Now have two big projects, in February 1999 Brian Eno presented project number 1 to politicians and business leaders at the Davos World Economic Forum. Long Now want to build a giant clock designed to run for 10 000 years. The aim of this global monument is to try to get people to think beyond the normal human concept of time, as measured by hours and days, and think instead in terms of centuries and millennia. If the Foundation secures funding they will build the millennium clock at a dry, desert site. The Foundation's second project is a library. Long Now want to set up a repository (again built in a dry desert site) containing information that will be useful over long periods of time.

The Long Now Foundation's activities pose a question to librarians and archivists. If artists and computer scientists are seeking to capitalize on the mythic quality of libraries to encourage long-term thinking are librarians and archivists both under-playing a responsibility and missing an opportunity? All the evidence suggests that in the past libraries did take a long view. And there is a lot of evidence – thanks to the excellent conservation properties of existing media like high-quality paper. The sheer longevity of some medical libraries also indicates planning for the future. After all, the library of the Royal College of Physicians of London started in 1518. The spectacular donations that many medical libraries have benefited from over the centuries also suggests long-term thinking. Dr William Mackenzie's gift of valuable ophthalmology books to the Royal College of Physicians and Surgeons of Glasgow in 1883 does not suggest short-termism.[3]

But what of today? Does long-term thinking feature in the current collection and retention policies of medical libraries in the United Kingdom? Or has it become a luxury? Long-term thinking may not be the top priority in a period when medical libraries are experiencing considerable change which is driven by a number of powerful factors, which include:

• the continuing information explosion;
• the acceleration of technological advance;
• the short-horizons of market-driven economies'
• the next-management change perspective of many organizations;
• the distractions of personal multi-tasking.

What is being collected?

What is in these changing libraries? The evolution of the collection of health information is not the remit of this paper. Alain Besson's last edition of *Thornton's Medical Books, Libraries and Collectors* provides a good overview.[4] However, it is worth listing what readers are currently using in medical libraries. After all, information is most likely to survive if it is both useful and being used.

In the book *Culture Health and Illness*[5] Hellman suggests that society has structured healthcare into three sectors:
1.   Popular
2.   Folk
3.   Professional.

Although many medical libraries contain health-related material falling into all three categories, the bulk of the material contained in the libraries discussed in this paper falls into the third category, the professional. In 1999, many of those involved in supplying information to professionals think that the most important conduit to that information is information technology.

Information technology allowing access to information resources

Many libraries have less and less space for journals or books. What space they have is for users and for computers. So what are 'readers' using computers to access? There is an increasing amount of full-text information online but it is still the case that most medical library users are searching abstracting and indexing tools and bibliographies.

Abstracting and indexing tools and bibliographies

One feature of medical information is long-standing bibliographic control. John Symons shows in *Thornton's Medical Bibliography and Bibliographers*[6] that structured medical information has been available to medical researchers for a long time. The most important bibliography was started in 1879 when John Shaw Billings first published a contents listing of the National Library of Medicine's journals. Interestingly, the subject headings Dr Billings used for *Index Medicus* were based on those developed by the Royal College of Physicians of London.

Bibliographic control of health information is now almost entirely in the digital domain. And the major source of information on biomedical subjects is still *Index Medicus,* which, inevitably, has been affected by the information explosion – since 1966 the indexers at the National Library of Medicine have scanned 3800 biomedical journals to build up a MedLine file that contains over 9 million records. MedLine is not the only database used in medical libraries – CINAHL, EMBASE, Healthstar, DHSS-Data and many others are important too.

Journals

In 1999, the printed journal is still the most important method of information transfer in medicine and the allied sciences. It is not surprising to discover from *British Library Research & Innovation Report* 65[7] that NHS libraries spend more on journal subscriptions than on books. Every year another 130 metres of shelf space is taken up by the Royal Society of Medicine's ever-expanding journal collection.

Medical books – reference, textbooks, evidence-based medicine guidelines etc.

Many medical library users still like to consult books. Despite the importance of journals and the understandable worries about the currency of information contained in monographs they still have a role. The new edition of the Medical Information Working Party's bibliography, *Core Collection of Medical Books,* has proved popular.

Grey literature

There is a major problem in the medical sector with grey literature, which is often poorly published and

publicized. Although ephemeral it may also be the only source of important information. John Hewlett, Director of the North Yorkshire Health Authority Resource Centre, states that the problem is especially acute in the NHS – where moves to deposit all locally produced information at the Department of Health have been poorly taken up. Local management records (like staff records) and information about the management of Trusts and Health Authorities, which have merged or ended, may well have been lost forever.[8]

Catalogues of medical equipment

John Burnett, Curator of Sports and Medicine at the National Museums of Scotland, recently emphasized the important link between medical and scientific instruments, and printed sources. Museums are much more likely to place objects in their research collections if they can find supporting documentation in catalogues or journals.[9]

Other categories

Medical Libraries also contain Government publications, reports, organizational records, pamphlets, pharmacopoeias, statistical works, conference proceedings, directories, dissertations and theses, iconographic material, manuscripts, practitioners' papers, medical ephemera and, to finish the listing, non medical monographs on botany, science, travel, etc.

What will be retained?

Perhaps not much in the way of 'conventional' material. Digital enthusiasts suggest that libraries will be in the meaningful gateway game. It may turn out that 26 June 1997 was a crucial date for medical libraries when Al Gore, the Vice President of the United States, launched the service that provides the world with free access to MedLine over the World Wide Web.

In the UK, 1999 may be a turning point. Plans for an ambitious 'National Electronic Library for Health' (NeLH) feature in the new information strategy for the NHS, *Information for Health*. The NeLH aims to provide both professionals and the public with easy access to the best current medical knowledge. As well as being the UK Government gateway to evaluated and validated health internet resources it will contain password-protected journals, clinical guidelines and patient information.

Enthusiasts for the NeLH suggest that it will change both existing libraries and the role of librarians. So it is likely that medical libraries will soon contain less hard copy. And this is appreciated by managers impressed by the economics of the rapidly emerging digital age. Digitization can certainly increase access, and reduce wear and tear on rare items. For most of this decade the scanners have been in overdrive in the Library of Congress, the Bibliothèque Nationale and the British Library as content is made much more accessible. Some think that digitization will answer our long-term storage problems as well. After all a head of the Intel Computer Chip Corporation has stated that "Digital information is forever."[10]

There are dissenting voices – some people are proving rather reluctant to embrace fully the electronic future. And the problems associated with maintaining continuity of content in the digital age are considerable. In a much quoted *Scientific American* article,[11] RAND researcher Jeff Rothenberg suggested that "It is only slightly facetious to say that digital information lasts forever – or five years, whichever comes first."

Collectors – the short term, the long term

The latest edition of the *Directory of Medical and Health Care Libraries in the United Kingdom and Republic of Ireland*[12] lists 851 providers of health information. This may well be a numerical peak and there are good reasons for supposing that the next edition will contain fewer entries. It is worth emphasizing that you cannot consider the listed libraries in isolation as they both participate in and benefit from formal and semi-formal networks.

At the start of this paper it was asked whether long-term thinking features in the collection and retention policies of medical libraries. An attempt was made to discover whether an answer could be found in the written collection development policies of UK libraries. Would written documentation reveal whether libraries consider if material will be useful in the future when they are acquiring it? From a small sample the answer is probably no, although it is reassuring to discover how many of the libraries contacted are currently working on collection development policies. Some libraries have obviously thought seriously about this and there are some good examples of collection planning. One thing is clear – retention policies depend on the kind of library and it is worth considering the main types. The relatively small collections of material held in public libraries are not covered.
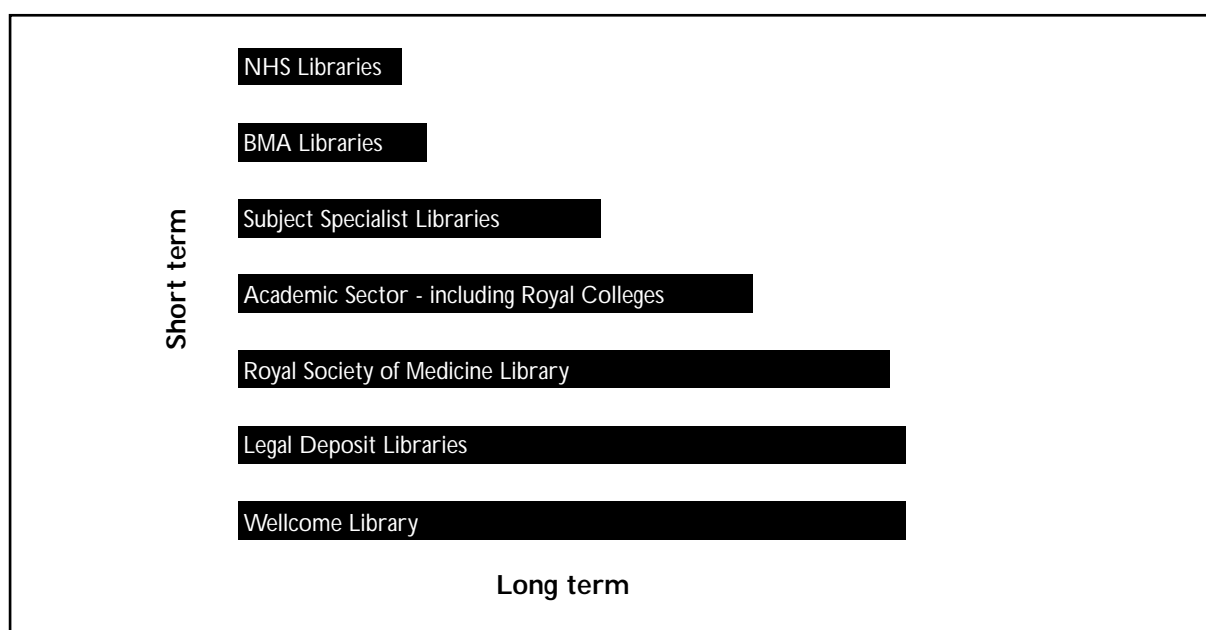

Figure 1
Collectors

Collectors' diagram

The diagram [Figure 1] shows the main sectors and institutions. It is an oversimplification but, in the main, libraries lower down the chart keep material for longer. Another (possibly useful) oversimplification is to suggest that the range of available material increases as you go down the listing.

NHS libraries

NHS librarians concentrate on maintaining information fit for the purpose of curing patients now. They do not see themselves as curators for posterity, at least, not of printed materials other than locally produced grey literature. Few NHS librarians have formal retention policies – they keep what is used most, and (using their own knowledge of their collections and readers) discard what is no longer of value. The relatively recent development of NHS libraries (since the 1960s) means that most of the material is only from that era. Many NHS libraries have space problems and it looks very unlikely that new hospital buildings will devote much space to library storage. In some areas there is a policy of keeping 'a regional set' of a periodical title so that one library has it in perpetuity. The lack of regional book catalogues makes it unlikely that cooperative book retention/discard schemes will be developed in the foreseeable future.[9]

British Medical Association Library

The British Medical Association Library offers a comprehensive national service to both personal and institutional members. Like their colleagues in the NHS, the BMA's librarians do not see themselves as curators for posterity. The BMA has space problems. In fact their library shelves are full and they have to dispose of enough unused items to free shelf space for each new year's volumes. According to their website there were two significant storage initiatives during 1997. They passed unique backruns of weekly medical freesheets like *Pulse* to the Wellcome Institute and they systematically weeded non-medical, historical and short-run titles from the collection.

Subject specialist libraries

The libraries in this grouping are more likely to cover specific (and therefore more manageable) subject areas. Many try to keep all the material related to their specialty. It is quite a wide sector that includes both Roche Products and the British Homoeopathic Library (which never throws books out). They may have space problems but when collecting will consider current value, academic value and factors like the institutional connections of an author.

Academic sector

Many higher education sector libraries support education and research associated with healthcare. For instance, universities like Manchester and Newcastle, have fine long-standing collections. Many academic institutions control a range of libraries – nursing, hospital, etc., which may be spread over several sites. Space pressures are considerable and older material is often moved from healthcare libraries to special collections departments. This move can stretch the librarian's role as an intermediary – a lot of special collections staff have humanities backgrounds.

The antiquity of the Royal College libraries was mentioned earlier. The Royal College of Surgeons of England has an outstanding collection, as does the (comparatively new) Royal College of Obstetricians and Gynaecologists and both benefit from subject specialism. Most of the Royal College libraries have made few disposals and think of the future when it comes to acquisition. The Library Committee of the Royal College of Physicians of Edinburgh spends considerable time trying to identify and purchase representative primary books, which they hope will interest future readers.

The Royal Society of Medicine

The Royal Society of Medicine (RSM) has one of the largest postgraduate biomedical libraries in Europe. The library provides a range of services, including literature searches and document delivery to both members and some non-members. The RSM is a very important historical resource particularly for those using journals for research. There are 10 000 periodical titles in Wimpole Street. The total collection size is estimated at half a million volumes. All stock is retained and space is a problem.

The British Library

The British Library (BL) plays a leading role in supporting medical and healthcare libraries. The Library's aim is to acquire all research-level serials in the medical field. Their selection policy for books is similar to that for serials, except that it is largely confined to the English language. They try to acquire all research-level English language publications in medicine, excluding textbooks, examination guides and popular works. Books on the study and research of nursing are in scope, but not basic nursing training guides. Alternative medicine is collected if it is aimed at practitioners. The BL's coverage of medicine is not comprehensive and they are considering limiting the number of new biomedical titles in order to preserve the overall balance of the collection.

The Wellcome Library

The primary purpose of the Wellcome Library is to provide a resource for the study of the history of medicine, both the theory and the practice, in its social, cultural and scientific contexts. Stored in the Euston Road is a fabulous collection of early works – an unsurpassed collection of secondary material,

and an impressive collection of primary medical and scientific literature. The period covered by the Wellcome's Modern Medicine Collection starts in 1850 and (at present) finishes in 1985. It contains 40 000 pamphlets, 30 000 theses, 6200 patent specifications and 11 000 serial titles. Only a limited quantity of primary literature is purchased every year – materials for the Modern Medicine Collection are mostly acquired through donations from other institutions, libraries and private donors.

Cooperation

It was stated earlier in this paper that you cannot consider medical libraries in isolation and that they both participate in and benefit from formal and semi-formal networks. Interlibrary lending has been the major engine driving this forward but there are now more and more initiatives looking at cooperation acquisitions. Both the academic sector and the national libraries are currently looking at their policies.

Even the Wellcome cannot cope with the medical information explosion. And the Library's (very comprehensive) collection development policy states that "there is an obvious need for cooperation to coordinate collection and retention practices of libraries. Although a certain degree of overlapping and duplication is inevitable, we should strive to keep duplication to the minimum necessary to serve our diverse user populations". Wellcome are seeking to collaborate with Imperial College and other universities to try to develop cooperative acquisitions of medical material.

Disposals

Cooperative inter-library lending, cooperative acquisitions – what about cooperative disposal? Do libraries attempt to place out-of-date material in a suitable home? It is quite surprising to discover in the section listing stock policy, in the *Directory of Medical and Health Care Libraries,* terms like – discard, destroy, pulp, sold off and thrown out. However, a lot of medical libraries do try to extend the life of superseded material by offering it to users, listing it on the Internet, or in regional or national swap lists, or by passing it on to developing countries. However, there is less evidence of cooperative storage for the future.

Costs

Medical libraries already contain a lot – and more and more material is being created. The task of sorting, collating, renewing and preserving all this information is proving increasingly problematic and expensive. The real problem of developing a long-term strategy is one of cost. And we have to answer the question of who pays and who benefits. And it is not just storage – you have to factor in the significant costs of researchers' visits. Unfortunately (as yet) the future cannot make payments to the past. So the economies of storage continue to be crucial. Individual libraries just cannot afford to keep everything forever.

In the academic sector, the Research Support Libraries Programme (RSLP), which derives from the deliberations of the Follett Review and the associated Anderson Report, is attempting to address some aspects of this problem and fund both traditional and new forms of access to library information, especially on a cross-institutional basis. However, there is a complication. Many major medical libraries, including the BMA, some of the subject specialist libraries, the Royal Colleges, the Royal Society of Medicine, and the Wellcome Institute are independent and privately funded – they cannot directly benefit from RSLP funding. Independence encourages diversity but it also hampers collaboration.

Conclusion

It is clear that we need to act altruistically to develop a mechanism for encouraging more collaborative acquisition and retention policies. Funding is needed for more 'retroconversion' programmes, particularly in the private sector. Subject-based collections of national importance in geographically diverse libraries could then be identified, staffed ideally by trained intermediaries who could provide advice on disposals.

At the start of this paper it was mentioned that the Long Now Foundation was trying to use the mythic quality of libraries to encourage long-term thinking. Perhaps one group who could benefit are the doctors and scientists who control many of the libraries discussed. In December 1998, Marshall Dozier, a librarian

at Edinburgh University's Erskine Medical Library, embarked on a responsible disposals programme. As part of the exercise Ms Dozier contacted many medics and asked them to come in and recommend books for retention – there was not a great response. It is difficult to interest scientists in old books.

But perhaps the problem could be reframed and managers might be persuaded to think of the future rather than the past. Could librarians capitalize on the mythic quality of libraries, draw attention to the material in their care and the long view by running a competition to encourage the healthcare professions to list the three greatest medical books of all time. The top ten would then be preserved for posterity using Norsam Technologies' HD-Rosetta system which 'permanently and safely' stores historical documents. Using this technology you can etch 1000 pages of actual text and imagery on to a 2-inch metal disc, which should last several thousand years.[14] The discs can be read with an optical microscope and since they do not contain zeros and ones, the only platform dependence is language. If the characters are designed correctly, the discs could be read either by computers with text recognition software or with a simple microscope.

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Mapping the future of research libraries

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[This paper was delivered at the conference via a live video-conferencing link.]

Good afternoon, everyone. I very much regret that I cannot be with you today. After I had accepted the invitation to speak, my university set this afternoon as the time for the annual meeting for the review and regrading of information services staff. It seemed impossible to neglect this. The organizers of the conference were kind enough to suggest that rather than find a different speaker, my long-distance participation would be preferred and so I appear before you as the ghost in the machine. But perhaps this unfortunate change of plan allows me to make my first point. Research libraries have always been international, but we can see that their future is to be global. Technology allows us to send and receive information instantly and comprehensively. What have been relatively simple problems of cataloguing, classification, preservation and access become enormously larger and more sophisticated, and will call on all our professional skills. Higher education has developed the concept of the Distributed National Electronic Collection and it is there that I believe our future lies – and lies in cross-sectoral distribution rather than in the airtight walls of the sectoral libraries that we have tended to operate in.

At present we have a government which seems set for at least two terms in office and one whose mantra is 'education, education, education'. This is a good time to be considering how we map the future of research collections in all media.

Powerful networks

We have put in place or are planning a series of networks for different sectors:

JANET	for Higher Education
NHSNet	for the Health Service
National Grid for Learning	for Schools
University for Industry	for Lifelong Learning
The People's Network	for Public Libraries
Metropolitan Area Networks	for everyone (?)

Thanks to Ministry turf wars and Treasury miserliness these are being planned both nationally and cheaply. It is the equivalent of building six light railways from London to York rather than one major new route. Fortunately, a combination of the relaxed connection policy for Metropolitan Area Networks and the ambition of some local authorities, means that a degree of integration will happen in at least some parts of the country, where broadband networks will be put in place. We need to press for this if we are to be able to distribute images and multimedia. A picture may be worth a thousand words, but an MPEG file takes forever to load.

The funding environment

For the first time in many years the funding environment is also conducive to a major development of research activity. The Government has already allocated some £50 million for the creation of content for the People's Network. We may expect a flowering of the digitization of local history records. Nor need we think of this as purely local history in the accepted sense. There is no reason why such material should not include everything from community information to hospital and social services records. The Heritage Lottery Fund/New Opportunities Fund also provides a potentially rich source of funding for content creation. In higher education the Research Support Libraries Programme has several tens of millions to support cataloguing, access, cross-sectoral cooperation and digitization. This follows on from the successful post-Follett report activities, which created perhaps £100 million worth of electronic library developments. The

large-scale funding of research infrastructure by the Research Councils also has the potential to be exploited by the fleet of foot who want to create a base of research materials. The management of electronic data sets has long been a concern of the Economic and Social Research Council for example. Also in the public sector we may expect to see the new Regional Development Agencies becoming powers in the land. They will have substantial budgets matched by those of the new governing bodies in Northern Ireland, Scotland and Wales. They are to be encouraged to have cultural and heritage policies and again we should be pressing for a liberal interpretation of what that means. Programmes such as SCRAN [the Scottish Cultural Resource Access Network] in Scotland have already shown what powerful multimedia resources can be created. The Digital Libraries Programme in the United States has a major international component in its second phase as, interestingly, it has recognized that large-scale content creation is a necessary prerequisite for the major uptake of digital libraries. To paraphrase Bill Clinton's famous election slogan, "It's the content, stupid".

Library and Information Commission

The Library and Information Commission has from its inception been a staunch advocate of cross-sectoral approaches to library provision and its National Research Strategy reflects this. As it moves towards the development of a National Information Policy we may expect to see it spending at least some of its limited funds in prosecuting this ambition. In fact so successful has it been that its role is to expand into cross-domain activities. Formally it is to merge with the Museums and Galleries Commission to create the new Museums, Libraries and Archives Commission, but in practice we may suppose that it is the dynamism of the former which has encouraged Government to propose the change. It is also interesting that perhaps for the first time, the use of the word 'archives' here represents a significant recognition of the role of archives and archivists, hitherto the 'Cinderellas' of the information world.

The national libraries

The role of the national libraries is an important one here, and there are welcome signs of imaginative thinking. The British Library has clearly recognized the importance of content, even if its recent attempt at a Private Finance Initiative deal has failed. It is some time since arrangements were made with the other legal deposit libraries to share the work of cataloguing. More recently some discussion has begun with the public libraries on sharing responsibility for the acquisition of local material. Electronic legal deposit is also firmly on the agenda. Now that the British Library has rid itself of the succubus of the planning of the new St Pancras building, we may except it to reassert its proper place as the major research library in the UK. However, in the new environment which is emerging its role must change to one of coordinating a massively decentralized system rather than being the dominant force in the land.

Access

A key element in the future map of research libraries is that of access. This is massively enhanced by electronic networks. Quite apart from the removal of the fear of the 'swamp factor' described by Bernard Naylor, the opportunity to move the content to the reader rather than the reader to the content opens up massive potential for resource sharing on a hitherto undreamed of scale. We know that the creation of electronic catalogue records leads to a growth in physical use of collections and can confidently expect the same to happen to digital content. However, digitization should be seen at this stage as an access surrogate rather than as a preservation medium. The major research collections remain unconvinced by the zealots that the technology is sufficiently robust for long-term preservation. Microform remains the preferred preservation medium. But perhaps the greatest beneficiary of digitization will be in the use of still and moving images. Almost by accident higher education's so-called Non-Formula Funding Programme for the Humanities placed substantial funding into the Regional Film Archives and this seems likely to be a resource of great significance for social commentary. Another highlight of this programme, which seems likely to be continued by the RSLP [Research Support Libraries Programme], is the development of a national archives server. It is broadly evident where major subject collections of books will lie, but almost impossible to make an intuitive guess as to where archive material may be found. The creation of a single entry point which gives high-level descriptions of archive collections should greatly facilitate access to what hitherto have been little-known specialized collections. In sum, then, the use of networks will improve access to the riches of the resource base scattered throughout the country's library and archive collections. We can increasingly see that coherence will be brought to the fragmented information base which we possess.

Cataloguing

Standards have always lain at the core of what we do. The description and recording of what we possess has been as sacred as the Ark of the Covenant to the profession. If the centrality of that activity has diminished in recent years with the sharing of records becoming an increasingly clerical activity, it is set to return to the heart of our professional concerns as we consider the uncontrolled anarchy of the Internet. Standards must again concern us. Here a great deal of work and experimentation is going on. The Dublin Core is, of course, the major international development, but in the UK projects such as OMNI [Organising Medical Networked Information] and the Arts and Humanities Data Service have begun to explore integrated access to decentralized provision. The MODELS standards promoted by UKOLN at Bath and the concept of clumps and hybrid libraries pioneered by [Joint Information Systems Information Committee] JISC's Committee on Electronic Information have opened up new areas of standards works which we need to resolve to ensure interoperability.

Two recent reports by Philip Bryant have highlighted the remaining large task of retroconversion of special collections. Much of that work relates to special collections belonging to organizations which either do not see the need for such work or who cannot afford to fund it. Again if we are to ensure ready access to research collections we have not only to map them but to convert the records which will provide access to researchers. In the area of standards we see the need for cooperation, coordination and the need for a total review of the research materials available in the UK.

Preservation

A corollary of this emphasis on coordination may be found in the area of preservation. A much wider range of players is now involved in the preservation of research materials. Much of the technology for preservation can be expensive and again the message to be sent is one of cooperation and sharing. Again higher education has marked the way by setting up a national centre at the University of Hertfordshire. In the same vein, the National Preservation Office has become a centre funded by different parts of the community. We can see here that issues of standards as well as preservation itself are better treated as common concerns.

Electronic materials

Let me turn finally to what Cliff Lynch of the Coalition for Networked Information has called endangered content. This now ranges from e-mail to the contents of hard disks to experimental records and administrative records. The history of science and medicine is no longer paper bound but we appear to be making no concerted effort to address this issue. It seems to me quite possible that the scientific history of the 1990s could largely disappear from the record unless these issues begin to be addressed by the academy as well as by librarians and archivists. This is perhaps best evidenced by what might be seen as the somewhat irresponsible attitude of organizations to electronic content. Many organizations have significant paper records management systems in place but it is extremely rare to find any such similar system for electronic material. The CATRIONA project based at Strathclyde has demonstrated both that organizations make no attempt to discover and manage the intellectual property created electronically by staff and that such management requires a significant level of professional information management skills. It is a rare institution indeed which has in place intellectual property rights agreements with its staff. Librarians have raised this issue in terms of research with frequent but ineffectual regularity in recent years. It is then ironic that it is the cost of creating teaching materials on the World Wide Web which may finally force organizations to act on this issue. It is perhaps the archiving of electronic material which worries me most. Thanks to such bodies as the Data Archive at Essex University we now have a clear understanding of the long-term issues in play here. Basically these are two: refreshing data is technically complicated and it is also very expensive.

The library paradigm

Historically, organizations have not lined up their members or users at the start of the year, offered them all, say, £100 and suggested that the individual then be responsible for their own information needs, for which the organization abdicates all responsibility. More typically they set up a library. The organization identifies its information needs and matching resources. It acquires these and collects them in one place called a library where they are managed, classified and preserved by information professionals. Arrangements are then set up to gain access to the information which cannot be held locally and is called document delivery. The same model works perfectly well in an electronic environment. Either an intranet

or a Metropolitan Area Network becomes the analogue of the library and information is acquired, mirrored or cached and held locally. This improves connectivity and allows issues of classification and preservation to be addressed and controlled by local professionals. This can be illustrated by comparing old and new activities.

Library tasks	Internet tasks
Acquisition	Resource discovery
Collection building	Local server farms
Classification	Knowledge management
Preservation	Long-term data sinks
Document delivery	Controlled network access
User instruction	User instruction

Conclusion

At a time of transition, mapping what faces us is a simple but sensible approach. The potential of the new technologies opens up hitherto undreamt of avenues of scholarship. By the same token it requires some redefinition of the process of scholarly communication. Whether or not we have a role in that is questionable. What we must certainly attempt to do is to take the increasingly fragmented records of scholarship and bind them in to an infrastructure which is global in reach but local in delivery.

Workshop reports

The two main purposes of this conference were to recognize the problems associated with preserving the contemporary record of medicine, and to try and identify practical proposals for cooperation to achieve that end. The workshops concentrated on the second of those issues. Each workshop had a chairman and convenor. The questions each workshop tried to address, within their various areas, were:

- What is currently being achieved?

- What are the problems?

- Where are the gaps?

- What do we know about what's going on?

- What needs to be done?

- Could greater collaboration help and how might it be achieved?

- What are the obstacles? What are the economic obstacles concerned?

- What are the priorities?

- What outcomes would you like to see from this conference?

- What specific projects or initiatives would you like to see take place?

Workshop 1 Printed material

Moderator: Chris Hunt
Rapporteur: Chris Hunt
Participants: Roy Allcorn, James Beaton, Patricia Brewster, Kelly Brown, Tina Craig, David Crawford, John Dallas, Geoffrey Davenport, Deborah Heatlie, Margaret Hoyes, Graham Jefcoate, Bruce Madge, Iain Milne, Ed Morman, Vivian Nutton, Tom Roper, Derek Scoins, Louise Shepherd, Helen Thomas, Alison Walker, Patricia Want, Nicholas Wyatt

The discussion generally related to post-1914 printed materials, concentrated on cooperation in a context of financial realities, and addressed both achievements and problems.

Present situation

- Ongoing improved access to the printed materials that constitute the history of medicine, notably the almost universal existence of online public access catalogues to individual collections, websites with lots of collection-level descriptions, and massive union databases such as OCLC, RLG and, in this country, CURL.

- Some fundamental working tools have disappeared such as BUCOP (the *British Union Catalogue of Periodicals*) and the *World List of Scientific Periodicals*. They were last updated in the 1960s, though in the computer age they ought to have been more easy to update.

- There are very few stand-alone history of medicine libraries with large amounts of funds. Most libraries acquired their history of medicine material because it was research or teaching material at the time. Current acquisition is similarly driven by the needs of the immediate clientele. Libraries don't have infinite money and infinite space, and any solution is a compromise.

- Cooperation is the only solution to these problems, but it costs, and some libraries are not publicly

funded and do not have any legal obligation to serve as public libraries. An encouraging thing is the development of consortia, local and other, that, generally speaking, guarantee access and even borrowing, and there are also some local agreements about preservation. Funding council grants, particularly to higher education libraries, are now being given on condition that general access is made available, at least to people in higher education. There are also national programmes, particularly those funded from the higher education sources, electronic libraries programme and other initiatives following from it.

Intelligent planning, with meetings like this as generators of ideas, are going to continue to produce the advances which will result in great improvements.

Recommendations

- A two-year research project to set out rules and guidelines, for the retention, preservation of, and access to, the printed record of medicine in UK libraries; a practical study of ways in which we can plan a future based on cooperation.

- The creation of a gateway to map the existence and location of history of medicine collections and information in UK libraries. The funding councils are already funding the creation of such gateways in rather large areas like the whole of humanities and the whole of physical sciences, a gateway for a tighter and more closely defined area relative to the whole of the humanities, like the history of medicine, can be done in a fairly short time and having created it, can be kept up to date.

- Encouragement of the National Preservation Office's efforts to create a database to aid preservation decisions.

- Plan an international conference in the medium term when adequate preparation has been made with libraries and other stakeholders to coordinate access to history of medicine information and collections across country boundaries.

Workshop 2 Journals

Moderator: David Stewart
Rapporteurs: Thalia Knight and Kate Sanders
Participants: Hazel Atlass, Victor Basile, Margaret Clennett, Liz Davis, Angela Douglas, Joe Fodey, Brian Furner, Mary Gooch, Liz James, Tony McSean, Pamela Michael, Morag Nisbet, Victoria Sinclair, Geoff Smith

The group discussed current activities such as purchasing consortia, the Scottish Academic Libraries Serials Consortium, and projects such as NESLI [National Electronic Site Licence Initiative]. Also, the British Library strategic review, which was set up to discuss the mechanisms for defining the problems and whose outcome will be very important for collaborative collection development; the NPO [National Preservation Office] initiative; CURL's activities in this area, especially those of a steering group looking at the creation of collection development policies; and the activities of the CHILL [Consortium of Independent Health Libraries in London] consortium in London, which is collecting acquisition policies and trying to establish what people are already doing.

The workshop also considered what periodicals are being collected and where the gaps are, and the collecting of grey literature.

Present situation

- Some consortia are beginning to address the question of collaborative acquisition. In this context it is very important that we recognize the need for a methodology which we can all understand and apply, and the training needs. There are some obstacles to consortia, such as geography, although in the British Isles, with the advent of modern technology, these collections aren't going to be hugely geographically separated.

- There is a need to formalize and coordinate existing informal networks and methods of cooperation. There are a number of related problems such as document delivery and geography, particularly when talking about actual physical journals. There are also related problems of storage, and cooperative storage doesn't seem to be a very active issue at the moment in this country.

- With e-mail and the World Wide Web, journal articles can be exchanged electronically. But there is the problem of copyright and licensing, obtaining access, potential inundation with requests if there is only one copy of a journal in the country or in London, which is going to affect the amount that is going to be supplied.

- There are a number of different union lists but the problem of access to the material remains. The higher education sector is currently experimenting with the use of the Z39.50 protocol as a possible way forward. In relation to serials and serial standards there are enormous difficulties, because at the moment Z39.50 provides access at the very highest level only. Getting access at the level of volume/issue is much more complicated.

- Due to budget cuts the British Library Document Supply Centre and other libraries have had to cut the number of titles being acquired. Usage has been the only criterion considered and has resulted in most of the cuts being foreign language titles.

- Grey literature, things like reports, locally produced leaflets, conference proceedings are not being globally collected. Also fringe titles, newsletters, material from pressure groups, are not being collected as a matter of policy by anybody in particular, and we can't assume that copyright deposit can catch everything.

- There is a need to define the roles of national libraries like the BL and large libraries like the Wellcome Trust and the Royal Society of Medicine, before we formulate our strategy.

Recommendations

- Endorse the suggestion of Workshop 1 for a two-year research project to try and find out what is currently taking place.

- A lot more positive encouragement for libraries to produce written collection development policies, and to publicize them.

- Provision of relevant help and training, and making positive use of initiatives already under way.

- Regional groupings. In terms of funding, one suggestion was that we put a certain amount of money from our budgets towards collaboration. There are some initiatives in place, such as the Research Support Libraries Programme. We look to the Wellcome Trust as a possible leader in this.

- Encourage the activity of any other relevant foundations. One of our American colleagues pointed out that there have been initiatives in the States where foundations have managed to speed developments in work in this area.

Workshop 3 Archives and records

Moderator: Mike Barfoot
Rapporteur: Mike Barfoot
Participants: Aileen Adams, Nicholas Baldwin, Phillip Clayton-Gore, Louise Corti, Margaret Currie, Vicky Dawson, Lois Densky-Wolff, Martin Eastwood, Sylvia Fitzgerald, Howard Hague, Peter Harper, Thomas Horrocks, Jean Hugh-Jones, Claire Jackson, Simon Jackson, Stephanie Kirby, Sidney Klaus, Diana Manuel, Susan McGann, Bob McLean, Robert Mills, Edward Myers, Mary O'Doherty, John Pickstone, John Skally, Julia Sheppard, Emily Simpson, Philip Toms, Wendy Walker

This was a large and heterogeneous group of academics and historians, archivists, librarians, museum curators, medics, records managers and clinicians. The workshop addressed the central questions with a number of different approaches.

Present situation

- A diversity of institutions and professions dealing with archives requires cross-sectoral collaboration.

- The question of gaps is very, very important.

- There is a rough division between NHS-based records and non-NHS records. National Health Service records are still very much hospital focused and, even so, there are major problems with the archiving of clinical records within hospitals.

- There is also an enormous movement away from the hospital towards community care and we haven't really begun to address this in any way. How are we going to collect community-based health records, of which GP records are by no means the only kind?

- Electronic archiving of both NHS and non-NHS records hasn't yet been properly addressed.

Recommendations

- Widen the audience of consultation before making recommendations, either for general things that need to be done, or more specifically for projects that will catch on to the various funding trails.

- Increase awareness of archival issues within the wider information community.

- Campaign for no further deterioration of current provision for health-related material. One of the ways to do this is to have clear collection development policies, clear retention and disposal schedules, good communication, and all the other things that enable one to enact them.

- Continue support for current work. The Hospital Records Project and MAMS [Medical Archives and Manuscript Survey] are very important, and they need to be continued and to be made portable to common platforms so that we can all access them.

- Record surveys are very important, but they need to result in policies and the collection of records at central sites. Therefore, surveys have to be built around sets of management guidelines that enable people to act on the basis of what is uncovered.

- Develop themed history of medicine and health electronic finding aids to support all repositories of health-related records in their user localities, in consultation with academic and other users. It is important that material is held locally, but made available globally.

- Greater coordination and cross-sectoral collaboration.

- Proper financial and staffing resource allocation is important for collecting for the future as well as preserving the past, and methodologies for collaborating in a cross-sectoral way need to be developed.

- As archivists and people who manage archival and records-related material, we do support all the other archive related recommendations of the workshops reporting here.

Workshop 4 Oral history

Moderator: Robert Perks
Rapporteur: Robert Perks

Participants: Adrian Allan, David Allen, John Burnett, Gordon Cook, Johanna Geyer-Kordesch, Susan Gove,
Isobel Hunter, Jane Kingsley, Jocelyn Koole-Krusineyer, Joan Mottram, Edith Ruby, Helen Ryan, Graham Smith, Dave Smithson, Andrea Tanner, Tilli Tansey, John Walker-Smith

The group, which included representation from many different disciplines and backgrounds, unanimously recognized the value of oral history. There was also a broad recognition that oral history is one of many historical sources, and can benefit from a holistic approach to collecting and presenting evidence. Oral history should be treated with exactly the same sort of rigour, analysis and scrutiny as other sources, and have a firm and well-established position in the archival framework.

Present situation

- There are many gaps and it is difficult to clearly delineate them all.

- There are many opportunities for research, but also for proactive work. It's not just gathering oral history that's important, but oral history as a process in itself has a particular value.

- The new medical curriculum presents important opportunities for oral history project work. The one-month module has been used with great success with pre-medical clinical students doing oral history projects and this is obviously a very valuable way in which they can gain new skills as well as gather material. So there are two different roles there: collecting and a process of skills acquisition.

- There is a need for formulating best practice and for greater guidance on how to collect oral history material, how to do an interview, what equipment to use, what interviewing techniques are the most appropriate.

Recommendations

- Convene a national Oral Sources Liaison Committee to bring together people who are working in as broadly representative fields as possible, including audio oral history recording and video work. Also, look at medicine in a broader sense beyond merely the history of medicine, look at health and welfare and include (for instance) patient perspectives and professional patient relationships. This liaison committee should take a proactive role and come up with positive suggestions for future project work.

- Following on from the previous recommendation, carry out a survey of oral history collections and holdings in the UK and Ireland. This should include tape material, transcribed material, and public archives, as well as private archives and personal archives.

- Web-accessible output should result from this survey, which would inform people about the condition, the content, and the availability of these collections. Some work has already been done and the results could be brought together.

- A one-day workshop on oral history best practice for historians of medicine which would look at some of these issues, particularly technical standards, digital recording or not digital recording, conservation and preservation, documentation, particularly around transcription. A strong recommendation that transcription of oral history tapes is an extremely good idea if funding is forthcoming.

- The issues around copyright and confidentiality would have to be covered within a one-day workshop. There are some published guidelines available from the Oral History Society about the position on copyright relating to oral history recordings. These are currently being updated and it would be a good opportunity to present these to historians of medicine and people working in that field.

- The Wellcome Trust should continue to support the one-week residential course for those historians of medicine who are interested in pursuing oral history techniques, and ensure that people funded by

the Trust to do oral history projects are properly supported with well-organized and authoritative training. We also feel that the Trust might be encouraged to fund a new edition of the existing published guide to best practice for historians of medicine.

- A slightly more controversial recommendation is that funding bodies might be encouraged to require award holders working in oral history not only to follow best practice, but also to have agreed a place of deposit for their tapes in advance of the project, so that they can be correctly documented and permanently preserved.

Workshop 5 Images, film and video

Moderator: James Patterson
Rapporteur: James Patterson
Participants: Jill Bailey, Pauline Brand, Susan Brock, Michael Clark, Julie Dorrington, Dugald Gardner, Jean Guy, Nicholas Hiley, Kelly Loughlin, Hilary Marland, Stella Mason, Fiona Robertson, Martin Rosenberg, William Schupbach, Nallini Thevakarrunai, Adrian Thomas

This relatively small group had a fairly wide-ranging discussion and addressed a number of issues.

Present situation

- There is a sense that image materials are not taken as seriously as printed sources and that in order to make progress towards better archiving more support from historians is needed.

- At the moment there are a number of collecting bodies, principally the National Film and Television Archive, the Imperial War Museum, the Regional Film Archive movement, and other organizations such as the Wellcome Trust and the BMA. There are also numerous organizations with image resource materials, especially moving image materials, but where the notion of preservation and long-term protection of the materials is not a matter of great concern. Organizations like the pharmaceutical companies have been producing materials and holding them in libraries.

- The situation with still images is even more fragmented, with collections held at the Science Museum, in local record offices, Research Councils, Royal Colleges and hospitals.

- There are a lot of gaps but they are almost impossible to identify because of fragmented production and absence of a unified catalogue of what is being created and retained.

- There are a number of different institutions collecting, archiving, preserving, presenting, and making accessible image materials related to history of medicine. But, they each have a different *raison d'être*, different approaches to acquisition, and different reasons for making material available to different audiences, though within that variety and anarchy there is a huge richness of resource.

Recommendations

- Encourage historians to make a much greater use of image material.

- Set up a project that would allow researchers to spend some time identifying places that might have image material, and raise awareness of the value of that material and the level of historical consciousness amongst those who have such collections.

- Establish an active website where people could exchange information about their collections and obtain help and advice on best practice for looking after the material, or contact specialists who could help them.
- Create a network of such organizations where we know they exist.

- Create a union guide to collections, rather than a union catalogue, which would assist researchers in finding relevant image materials and make it available on the web. The idea of union catalogues was

thought to be impractical because of the great diversity in the cataloguing of moving and still images.

Workshop 6 Electronic media

Moderator: Frank Norman
Rapporteur: Frank Norman
Participants: Anne Barrett, David Brady, Suzy Cuthbert, John Davies, Alex Haig, Leonie Jones, Robert Kiley, Mandy Mordue, Peter Morgan, Tim Powell, Zina Sabovic, K W Spence-Lewis, Dominik Wujastyk

The group had a wide-ranging discussion which addressed issues such as standards, the importance of technical standards, the problems of using old laser discs, the role of metadata, statistics, the roles of IT managers, and racial issues in health information. Many participants felt they were attending this workshop in order to learn, and find out about what's happening, rather than as experts to formulate solutions.

Present situation

- There is not a great deal that we can collaborate on at present, because so much of the activity going on is felt to be at an early stage.

- In terms of information provision the focus is usually on the most recent version of CD-ROMs, but it is important that multiple versions of CD-ROMs, multimedia CD-ROMs or databases are preserved for posterity.

- Because of the unique problems of digital content, and the need for migration and refreshing, preservation is very difficult or impossible. Therefore, digital content needs to be captured at the moment of creation and its creators need to be aware of this. A cultural change is needed.

- The situation of records management in general, and electronic records management in particular, is dire, and rules for electronic records management are urgently needed.

- At the moment very few of as are thinking, let alone doing anything, about preserving websites and capturing multiple versions.

- The problem of copyright of electronic publications is important and needs to be solved.

Recommendations

- Continuing multiprofessional discussion between archivists, publishers, librarians and historians. Also, it would be worthwhile making contact with European Commission on Preservation and Access.

- Campaign to make people aware of the issue of capturing digital content and have a plan for capturing the content in a standard format. Also, encourage creators of digital content to retain the copyright. We understand that the British Society of Authors already recommend[s] this.

- A survey of the current practices in electronic records management throughout many institutions, identifying good practices, and turning these into recommendations for records management more widely.

- Establish a project to document existing CD-ROMs and digital content, especially multiple versions, as a precursor to preservation. Also, lobby to extend legal deposit to cover CD-ROMs and other digital media.

- Develop strategies for preserving information on the World Wide Web. Identify good practice,

formulate recommendations and disseminate those more widely. Legal deposit of web materials does not seem a sensible option, but there may be three possible strategies. Firstly, encourage institutional policies for capturing the contents of websites, and their multiple versions. Secondly, take specialist snapshots of the web by using a software such as Vampire, which captures the content of websites. (There is a problem of copyright here and it was suggested that we should lobby regarding the new European Union copyright directive which would apparently take much of this activity outside the scope of the law.) Thirdly, broadly sample a wide spectrum of web material, not just the things which we believe to be good and well-used today.

Biographies

Derek Law
Director of Information Strategy, University of Strathclyde
Derek Law is a former medical librarian with over twenty-five years' experience in Higher Education. He is currently Director of Information Strategy at the University of Strathclyde. He has been much involved in the development of electronic libraries in the UK and is a frequent author and lecturer both here and abroad.

Dr Kelly Loughlin
Health Promotion Research Unit, London School of Hygiene and Tropical Medicine
Kelly Loughlin has an MA in Cultural History and a PhD in the Social History of Medicine. At present she is a research fellow on the 'Science Speaks to Policy' programme at the London School of Hygiene and Tropical Medicine. This is a programme of historical work exploring the relationships between health/medical research and policy in post-war Britain. Kelly's interests are centred around the role of the media in the science-policy interchange.

Bruce Madge
Head of the Healthcare Information Service, British Library
Bruce Madge started his library career in the 1970's at the London School of Hygiene and Tropical Medicine. In 1980 he was appointed Librarian of the National Poisons Unit where he remained for 9 years until he became District Librarian at Bromley Health Authority. After a spell as Information Officer (Medical Informatics) at the British Medical Association, in November 1995 he became Head of the Healthcare Information Service for the British Library. He is in charge of the section that indexes 25% of the UK input into Medline and produces the Allied and Alternative Medicine Database (AMED) as well as having a corporate role as health advisor within the British Library. He represents the British Library on the Health Panel of the Library and Information Co-operation Council, and is past Chair of the Health Libraries Group of the Library Association.

Iain Milne
Librarian, The Royal College of Physicians of Edinburgh
Iain Milne has spent most of his career at the Royal College of Physicians of Edinburgh, including periods as Deputy Librarian and as Information Technology Manager.

Helen Shenton
Deputy Director of Preservation, The British Library
Helen Shenton joined the British Library last year after 14 years in the Conservation Department of the Victoria and Albert Museum. She started at the V & A as a book conservator, having trained at the London College of Printing and with the Arts and Crafts bookbinder and conservator, Roger Powell. She has taught and examined conservation courses, edited journals, such as The Paper Conservator , and lectured and published on subjects ranging from practical conservation projects to preservation strategies for collections.

Julia Sheppard
Head, Contemporary Medical Archives Centre, Wellcome Library
Julia Sheppard has been Archivist of the CMAC since it was established in 1979. The CMAC locates, preserves, and makes available for research, the archives of c.400 individuals and organisations which have contributed to health care and research in the 20th century. Many of these archives are of national importance, and well-used. The Centre is also involved in survey work to advise on materials of relevance elsewhere. A qualified archivist, she previously worked At King's College London as Archivist of the Liddell Hart Centre for Military Archives.

Dr Tilli Tansey
Medical Historian, Wellcome Institute for the History of Medicine
Dr Tansey is historian of modern medical sciences at the Wellcome Institute. She spent many years working as a research neuroscientist before taking a second doctorate and becoming an historian

specialising in 20th century medical sciences, especially physiology and pharmacology. She is the co-editor of Women physiologists (Portland Press, 1993); Wellcome Witnesses to twentieth century medicine (Wellcome Trust, volume 1, 1997; volume 2, 1998); and Ashes to Ashes - the history of smoking and health (Rodopi, 1998).

Professor Tom Treasure
Professor of Cardiothoraic Surgery, St George's Hospital
Professor Treasure is a heart and lung surgeon, active in teaching and research. In addition he has an interest in medical history. He spent a research sabbatical at the Wellcome Institute and has first-hand experience of the problems of unearthing evidence from stored archives.

Dr Jeremy Wyatt
Director, Health Knowledge Management Programme at the School of Public Policy, UCL
Dr Wyatt is also Senior Fellow in Health and Public Policy, University College, London as well as Senior Fellow, Centre for Statistics in Medicine, Institute of Health Sciences, Oxford University. He has a Doctorate of Medicine from Oxford and is a member of the Royal College of Physicians.