

# Not *either...or* but *both*. The life cycle of collections at the British Library

Helen Shenton  
Keynote

## Introduction

When the IPC put out a call for papers for this conference, it said that it was celebrating 30 years of achievement in conservation and wanted a professional debate about the relationship between practical conservation and preservation of paper and book in the twenty first century. At the British Library it is not a question of *either* conservation (meaning interventive treatment) *or* preservation (meaning preventive initiatives) but a question of doing *both* ... and doing *both* in different ways. Moreover, for a national library collection in the twenty first century it is not a question of stewardship of *either* traditional paper-based material *or* digital material but a question of preserving *both* together with all the intermediate stages of development in between, from papyrus, parchment and paper to ticker tape, betamax tape, dat tape, bits and bytes.

The following paper examines the response of the British Library (BL) to the changing nature of, and relationship between, practical conservation and the preservation of its growing, dynamic, highly-used, multi-formatted collections. On the one hand, the BL is reinforcing the need for skilled, specialist conservators to treat iconic collection items such as the Codex Sinaiticus, the earliest New Testament in existence,<sup>1</sup> and the Diamond Sutra, the earliest dated printed book known.<sup>2</sup> On the other, the BL is developing the repertoire of preventive activities to minimize the risk of damage to the collections.

Connecting both conservation and preservation of both traditional and electronic material is the life cycle of the BL's collections. A whole-life philosophy to managing the stewardship of the collections is being developed, which shows the interdependencies between all the different stages in a collection item's life to reinforce conservation and preservation as central, core activities.

## Integrated stewardship

Societal trends clearly influence the type of material requiring care. Now society in general is in transition from being: 'People of the book', to being: 'People of the screen'.<sup>3</sup> The former being those whose culture is founded in text; the latter those who experience constant visual flux through cinema, television, telephone, computer and GameBoy screens.

This intergenerational shift could be characterized as being one between carbon-based carriers (paper) and silicone-based carriers (IT). Whilst more electronic information is being produced in more formats, more books are being published in paper format.

To give a very practical manifestation of carbon and silicone in terms of what is already being curated at the BL, it has just been calculated that the Library houses approximately 5 billion ( $\pm 10\%$ ) pieces of paper of which about 750 million pages ( $\pm 10\%$ ) are newsprint. That is, 5 billion pieces of organic, carbon-based material that act and deteriorate in a certain way. In contrast there are, for example, already 200 terabytes of electronic material in the BL including 3 million digitised images alone and many scientific journals which now only exist in electronic format (known as *born digital*). The preservation needs of all this digital material has to be addressed.

This is about the G generation, the Google generation, who increasingly expect information to be available over the web, available at all times, available for free: 'increasingly time and space independent'.<sup>4</sup> This has been called the:

<sup>1</sup> S. McKendrick, *In a Monastery Library: preserving Codex Sinaiticus and the Greek written heritage* (London: British Library, 2006). Also see <<http://www.bl.uk/news/2005/pressrelease20050311.html>>.

<sup>2</sup> M. Barnard and F. Wood, 'A short history of the conservation of the Diamond Sutra manuscript in London', catalogue of an exhibition: *The Silk Road – Trade, Travel, War and Faith*, ed. S. Whitfield (London: British Library, 2004) 97–104.

<sup>3</sup> K. Kelly, 'Will We Still Turn Pages', *Time Magazine*, June 19, 2000. See also, K. Kelly, 'Scan This Book!', *New York Times Magazine*, Sunday, May 14, 2006, 42/3–49, 64, 71.

<sup>4</sup> See the British Library's Vision in *The British Library Annual Report and Accounts 2004/5*, 22–23 available at <<http://www.bl.uk/about/annual/2004to2005/pdf/strategy.pdf>>.



Fig 1 King's Library Tower. Image reproduced with kind permission of the British Library Board.

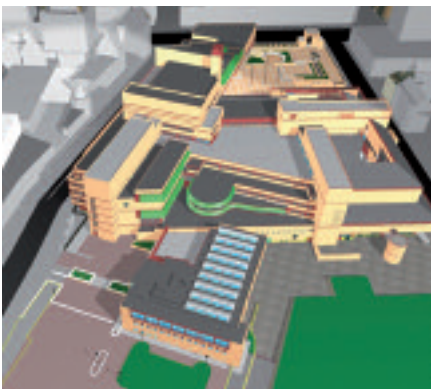


Fig 2 British Library including the new Centre for Conservation in the foreground, artist's impression. Image reproduced with kind permission of the British Library Board.

'Amazoogle expectation'<sup>5</sup> and is one of the greatest issues that libraries and archives are confronting. This affects everyone in conservation, for example, Tate now talks about its web site being its fifth gallery<sup>6</sup> and there is also an increase in time-based media or digital art that need preserving.

The BL recognises that it has a national role in managing a large number of different types of material and is taking a conscious, what it calls a *format-neutral* approach to the stewardship of the collections. The philosophy is that from a collection management view point, there is one national library collection, regardless of format, whether it is on birch bark, bits or bytes.

### British Library

The vision of the British Library is:

'To make the world's intellectual, scientific and cultural heritage accessible, and to bring the collections of the British Library to everyone – at work, school, college or home.'<sup>7</sup>

Founded as the British Museum Library in 1753, the British Library was created in 1972 by an Act of Parliament from a number of major national institutions (Fig 1). It incorporated the British Museum Library, the Patent Office Library, the India Office Library and Records, and the British Institute of Recorded Sound. It is the UK Legal Deposit Library which means that, by law, a copy of everything published in the UK and Ireland must be deposited within it. The Library has a responsibility in perpetuity for those collections, which has a sizable impact on how the importance of preservation is viewed.

The collection includes 150 million items in most known languages, dating from 300BC to today's newspaper. The collections comprise manuscripts, (310,000 ranging from Jane Austen to James Joyce to Handel), maps (over 4 million), newspapers, magazines, prints and drawings, music scores, patents (50 million) and sound recordings from nineteenth-century cylinders to the latest CD, DVD and mini disc recordings. Treasures include the Lindisfarne Gospels, the Magna Carta, Leonardo da Vinci's Notebook, the first edition of *The London Times* from 18 March 1788, Beatles' manuscripts and the recording of Nelson Mandela's famous speech at the Rivonia Trial of 1963.

Each year, some 150,000 items are deposited by law and altogether 3 million items are incorporated every year. This means that the collections grow by 12km (7.5 miles) of shelving every year, in addition to the 625km (390 miles) of shelving that already exists on two main sites in the north and south of England. Since November 2003, legal deposit has been extended to include electronic publications. A voluntary code of deposit was introduced in 2000, since which time some 150,000 digital items have been deposited. It is, consequently, a dynamic collection and this influences the methods employed for its care.

The use by, approximately, half a million readers visiting the reading rooms, requesting as many as two and a half million items, also adds to the mechanical wear and tear of the collections. Non-readers visit the BL for the three exhibition galleries; one of which exhibits treasures on permanent display; another houses a changing programme of temporary exhibitions and the third is a workshop gallery.

### Conservation

#### British Library Centre for Conservation

A major development is a project to build a new British Library Centre for Conservation (BLCC) in London. This purpose-built centre is due to open in 2007 on the St Pancras site (Fig 2). The £13.25 million cost of the centre has been raised from a combination of government funding and private and public funds. There have been three main, intertwining and inter-locking elements of the BLCC, namely, construction, fund-raising and a change programme. The resulting BLCC will be the only such facility in the world. The vision is to:

- 1 Create state-of-the-art book conservation studios and sound archive technical studios collocated for the first time together with the collections.
- 2 Incorporate public access and educational opportunities as a fundamental part of the design.

<sup>5</sup> *Amazoogle*, coined by L. Dempsey in 2004, 'Libraries in the Age of *Amazoogle*', JISC/CNI conference, June 2004, <<http://www.oclc.org/research/presentations/dempsey/brightonowc.ppt>>. See also, 'The Inside out Library; Libraries in the Age of *Amazoogle*' LIBER conference, Groningen, 2005 <<http://www.oclc.org/research/presentations/dempsey/liber.ppt>>.

<sup>6</sup> J. Rellie, 'Digitising Delivery at Tate Online', *C21st Curation: access and service delivery, Ariadne* 48 (July, 2006) <<http://www.slais.ucl.ac.uk/c21/Rellie/>>.

<sup>7</sup> *The British Library Annual Report 2004/5*, 22.

- 3 Create training and educational facilities for conservation to replenish the profession of book conservation and for the interested public.
- 4 Apply scientific research on materials to the conservation of library holdings.

The BLCC will focus on being a centre of excellence for book conservation. It will bring together oriental and occidental book conservation for the first time, together with preventive book conservation, such as archival phase boxing and it will allow for the conservators funded by the *Adopt a Book* fund-raising scheme to join colleagues in the same studio space.

Half of the 80 conservation staff is still working in very inadequate facilities two kilometres away on the British Museum (BM) site (it is the only part of the BL still on the BM site since the BL vacated the BM in 1998) with all the obvious disadvantages of split-site working. The centre will also house audio preservation studios, which are currently several kilometres away in sub-optimal facilities. The new building will, in addition, incorporate professional training, public tours of the studios and demonstrations.

In some ways the new construction is an upside-down building. As a key requirement in the main studios was north light, the majority of the space will be on the top floor with glazed top-light from a zigzag roof (Fig 3). The large studios on this floor will accommodate 48 conservators, with groups of 8 benches around shared equipment to delineate the different teams. Aqueous treatments will be separated into an adjoining area along one wall. There will be distinct spaces for finishing and leafcasting on this top floor, together with a flexible studio for book-care processes and demonstrations.

The Centre will be reached across a new public square, with the entrance across this terrace through a visitor and learning centre, adjoining an education suite. The exterior square is designed to be at a height suitable for a future walkway from the adjoining new St Pancras EuroStar Railway Terminus, also opening in 2007, to Euston Station (Fig 4).

On the middle floor there will be specially designed areas for archival box-making adjacent to materials storage, an area for marshalling exhibition items going out of the Library on loan, quiet meeting rooms, a scientific examination facility and a workshop for dusty and dirty work, as well as a quarantine room adjacent to the loading bay. The lower floor comprises mainly *floating* studios to achieve the very high acoustic specification for audio preservation.

#### Public access

The incorporation of public programmes of visits, demonstrations and the explanation of conservation has been part of the fundamental design of the BLCC and the Conservation Studios (Fig 5).

#### Training and Development

The other new element in the new studios will be funded internships and training in book conservation. This is in response to a much-talked about crisis in book conservation training in the UK, with six out of eight courses having closed over the past five years. It is also a response of self-interest. When analysed in 2004, 19% of staff in the Conservation Department were due to retire in the next 5 years, rising to 25% of book conservation staff. Many of these conservators have decades of experience and were trained in a way unavailable today.

The first Head of Conservation Training in a UK library or archive was created with a remit not only to address the development of the current 80 conservators at the British Library, but also to address the crisis in book conservation training in the UK and define what part of that training the BL should provide. A piece of fundamental research was undertaken to determine whether there is a need for the conservation of book collections in the future; and if so, whether there is a need for book conservators. An international questionnaire demonstrated that there is a perceived need for book conservation and therefore for training, at current if not increased levels. An interesting finding was that respondents



**Fig 3** Artist's impression of final Conservation Studios showing the zigzag windows providing north light to the upper Conservation Studios. Sound Studios on the lower floor are built using blockwork, thermal and acoustic insulation and sit on reinforced concrete slabs floating on acoustically isolating rubber pads some 600mm thick. Image reproduced with kind permission of the British Library Board.



**Fig 4** Construction underway of the new studios (2006) with St Pancras EuroStar Railway Terminus in background. Image reproduced with kind permission of the British Library Board.



**Fig 5** BLCC construction 2006 with the Eurostar Terminus in the background. Image reproduced with kind permission of the British Library Board.



thought that in the light of digital developments, the value of the book as artefact will increase rather than decrease, with a commensurate increased need for skills to conserve books as artefacts.<sup>8</sup>

The need to replenish skilled book conservators was therefore not confined to the BL alone but was considered to be a national and international need. In response to this the BL is working with Camberwell College of Art (part of the University of the Arts) on setting up a two-year Foundation Degree in Book Conservation, designed to address the industry-identified practical skills shortage. It is planned that the BL will be one of the partner institutions that will contribute towards the practical element of the course. The BL is contributing designated studio space in the new Centre and national vocational qualifications (nvq) for training the trainers ahead of moving to the new building.

In addition, a programme of BL internships with funded bursaries will build on the modest *ad hoc* internships and placements accommodated currently. The first funded internship of £10k each from the Heritage Lottery Fund has just been advertised.

The new BLCC is much more than just a building project. It is being used as a catalyst for a wide range of changes and improvements, from cultural and organisational through to reviewing all the conservation treatments and materials that are currently employed.<sup>9</sup>

### Conservation Research

The BL has also identified the need for applied conservation research applicable to caring for the collections in libraries and archives in UK and internationally. The first Head of Conservation Research in a UK library or archive was appointed in 2003. In 2004 *The British Library Applied Conservation Research Strategy*<sup>10</sup> was produced and the BL attracted funding from the Andrew W. Mellon Foundation for an international roundtable discussion to produce a peer-agreed strategic framework of priorities for conservation research in the library and archive community in the UK over the next five years.<sup>11</sup> The emerging themes are:

- 1 The 'life cycle of the collections', including life-cycle prediction, natural ageing of materials and the evaluation of preservation strategies.
- 2 The effects of the storage environment, including the selection of the optimum environment for different materials.
- 3 The non-destructive methods for assessing damage to materials.

The emphasis on applied conservation research and the collaborative, outward-looking approach reinforces many BL corporate strategies, particularly the promotion of the public understanding of science and the importance of science and technology in the Library's collections. On a practical level, examples of the collaborative approach are illustrated by the involvement with the EU-funded SurveNIR<sup>12</sup> project to develop an infra red spectrometer for measuring the deterioration of paper which can be used in future condition surveys, and the EU project *InkCor*<sup>13</sup> investigating iron-gall ink corrosion on paper textblocks, which is a major problem in library and archive collections.

Recently the BL was awarded a Mellon grant of \$700,000 for two projects to be run over the next three years. The first looks at the condition of identical books in different nationally significant libraries. By analysing the condition of identical books published in the UK since the Copyright Act of 1710 in the six different copyright libraries in the UK and by using historic data about the storage environments, the project aims to enable more accurate prediction of the future condition of books.

In the second project, volatile organic compounds (VOCs) given off by books will be analysed. Paper emits a complex mixture of organic compounds as it ages, including volatile acids, which form the characteristic smell of old books. They contribute to the further degradation of paper, and it appears that the mix of compounds is characteristic of different papers, the degree and rate of degradation and the pathway by which the paper is degrading. By sampling the air in book stores and measuring the quantity of acid produced, this project aims

<sup>8</sup> British Library Study, *The need for book conservation in the UK and Internationally*. Full report at <<http://www.bl.uk/about/collectioncare/pdf/webconservation.pdf>>. See also, C. Atkinson, 'British Library Study: The need for book conservation in the UK and Internationally', ICOM CC Education Working Party, Vantaa, 2004, <<http://www.evtek.fi/design/current/icom-cc/Vantaa2.pdf>>. Accessed 2006.

<sup>9</sup> Internally, an internationally validated review of all conservation treatments is being carried out, to ensure consistency and best practice. A skills audit will ensure that there is the right match of skills to care for the changing nature of the collections and to follow through the findings of the Conservation Treatment Review. This is part of an initiative to ensure conservators are fully prepared with new skills demanded by the BLCC (such as giving public tours) and that existing skills are refreshed.

<sup>10</sup> British Library applied conservation research strategy: <<http://www.bl.uk/about/collectioncare/pdf/futurelife.pdf>>.

<sup>11</sup> *Future Life of Collections*, Report on a meeting on Applied Conservation Research held at the British Library, 27–28 September 2004, supported by the Andrew W. Mellon Foundation. <<http://www.bl.uk/about/collectioncare/pdf/futurelife.pdf>>.

<sup>12</sup> EU-funded SurveNIR project to develop a Near Infrared Tool for Collection Surveying. <<http://www.science4heritage.org/survenir/>>.

<sup>13</sup> EU-funded *InkCor* project on the, 'stabilisation of iron gall ink containing paper'. <<http://www.infosrvr.nuk.uni-lj.si/jana/Inkcor/index.htm>>.

to help libraries designing stores to minimise the rate of paper degradation and also give an early warning of when the level of acid in the books is reaching dangerous levels.

Conservation research has become a Government issue demonstrated by the British Library's recent participation in a House of Lords Science and Technology Sub-Committee hearing on Science and Cultural Heritage. The Enquiry is investigating conservation research across all the cultural sectors.<sup>14</sup>

However, this is only part of the picture. The BL operates a mixed economy, combining in-house conservation that is not available on the required scale externally or for which the BL does not have, and does not intend to have, expertise such as tapestries or globes, together with outsourced routine operations that can be provided more cost-effectively externally. Most of the non-routine conservation of the BL's collections is carried out in-house, prioritised annually by weighted scoring of bids from the Collections, which leads to the preservation of the Library's collections.<sup>15</sup>

### Preservation

Given the scale of the BL's collections, the levels of usage and the dynamism of the collections, interventive conservation is only justifiable for some items. For the totality of the collections, preventing damage is the overall approach.

### Storage building

Taking into account all the range of factors contributing to the entropy of the collections, one of the single most effective actions that the BL can take, which will impact all the collections in the long term, is the improvement of the environmental storage conditions.

The percentage of collections in satisfactory environmental conditions<sup>16</sup> has risen from 0% before the building at St Pancras to 42% by 1999 once the St Pancras site was occupied, rising in 2006 to 44% due to a greater density of stock at St Pancras. A major storage programme is underway to increase the percentage by 2022/3 to approximately 65%.

The impact of this is extremely significant. It is estimated that the Newspaper Library alone contains some 750 million sheets of paper. The average life expectancy of a piece of paper can be estimated using thermal kinetic modelling.<sup>17</sup> Given the Library's legal responsibility to preserve material in perpetuity, the evidence for low temperature storage is compelling. Newsprint stored at 10°C more than doubles its predicted lifespan to 182 years and at 5°C doubles again to 360 years.

Other factors that effect the BL's collections include air pollution (in particular volatile organic acids) and light (causing photo-catalysed oxidation), and inherent causes of deterioration within the materials themselves (for example the 1850s mechanical wood pulp and alum rosin sizing in mass-produced paper causes acid hydrolysis). These internal and external factors are compounded by mechanical wear and tear as the collections are used.

As the Library's holdings expand to include digital material, research has been undertaken into the future shape of collections and the so-called flip-over point, when the majority of publications would flip over from being predominately print and paper-based to being predominately digital.<sup>18</sup> The findings were, again, not a question of *either* print publications *or* digital projections but *both* and so the BL has to store both.

The BL's St Pancras building stores about half of the Library's collections, predominately the high use and the high value material. The rest of the collections are stored in buildings around London and in Boston Spa in the north of England. The BL property strategy is for any new building to be on the Boston Spa site as it is substantially less expensive than building in London. The strategy envisages any new building supporting an increase in the percentage of collections in satisfactory environmental conditions, so that any move of collections should result in the collection items being in better storage than they were in before. This strategy also insists that a move should maintain (and

<sup>14</sup> House of Lords Science & Technology Sub-Committee ii. *Inquiry into Science and Heritage*. Transcripts of the 8 meetings of evidence held between 14th March and 6th June 2006. The 38 written submissions are available at: <[http://www.parliament.uk/parliamentary\\_committees/lords\\_s\\_t\\_select/sub2evidence.cf](http://www.parliament.uk/parliamentary_committees/lords_s_t_select/sub2evidence.cf)>. The written evidence and the transcripts of the oral evidence given are a very interesting snapshot of scientific research in the conservation field and, specifically, how applied conservation research in libraries and archives is developing.

<sup>15</sup> The method of prioritising the preservation and conservation requirements of the BL's collections is based on a scoring mechanism, weighted according to *Access, Use, Accommodation, Condition & Usability* and *Value & Importance*. The findings of a condition audit are overlaid onto this annual preservation and conservation priority-setting process, to ensure that the broad categories identified as the highest priority, most vulnerable material are treated. A fundamental condition audit of the comparative physical condition of all the BL's collection was completed in 2005 to a nationally-agreed sample methodology developed with the BL. A subjective assessment of the collections had been carried out in 1994; however this was the first such objective assessment of the BL. The survey revealed that 86% of the collections are stable; 14% are unstable including 5% unusable. This 5% equates to approximately 1 million items and is disproportionately concentrated in the newspaper collection. D. Novotny, 'Ink causes a stink; Preservation Advocacy in the UK', IFLA Seoul, August 2006. <<http://www.ifla.org/IV/ifla72/papers/090-Novotny-en.pdf>>.

<sup>16</sup> Defined as meeting the appropriate British Standard 5454:2000 *Recommendations for the storage and exhibition of archival documents*, British Standards Institution, 2000 (London: The Stationery Office).

<sup>17</sup> Cool and cold temperature storage is the strategy of choice for the majority of North American research libraries comparable to the BL. For example, with a decrease in temperature from 27°C to 16°C a piece of newsprint will increase its useful life over fourfold from 19 years to 83 years.

<sup>18</sup> H. Shenton, *Digital versus print as a preservation format* (London: British Library, 2004). The research is available at <http://www.bl.uk/about/collectioncare/digpres1.html>.



**Fig 6** The British Library's proposed new off-site storage building at Boston Spa due to open in 2009. Image reproduced with kind permission of the British Library Board.



**Fig 7** High density automated storage. Image reproduced with kind permission of the British Library Board.

improve where feasible) service standards to users, and it should constitute a sustainable facility.

The most urgent reasons for the building programme are that the BL is this year (2006) operationally full and that the collection grows by 12 linear kilometres per year. One imperative was to design the maximum amount of storage on the minimum footprint. The result is a plan to build a high density, fully automated store to accommodate 260 linear kilometres of low use, primarily printed collection material at Boston Spa (Fig 6).<sup>19, 20, 21</sup>

The new storage building plans to separate out people from process. Using warehouse technology the collections will be stored in containers, two containers deep on shelves. The shelving will be approximately 26m high. The containers will be retrieved by fully automated cranes, travelling up and down the aisles, directed remotely by a warehouse management system. Full automation means storing the books in containers or totes. The size and material of totes is critical as the container is the building block around which the whole operation is sized and designed (Fig 7). The automated cranes will deliver the containers onto a conveyor belt that will move the books to a separate area where people will remove the individual item from the container. It builds on the semi-automated systems in use at libraries such as Yale, Harvard and Bibliothèque Nationale de France's Marne le Valey site. The National Library of Norway has used such a system in its storage facility in Mo I Rana in the Arctic Circle (Fig 8).<sup>22</sup>

The storage environment can be specifically tailored to the collections. There is no light, reducing the risk of damage from photo-catalysed oxidation and minimising the risk of damage from UV. Heat from light is minimised helping the cost of the air handling.

When the designers investigated fire suppression systems, the cost and practicalities of having sprinklers in such a facility became issues. A fairly recent development in warehousing fire prevention is the use of lower oxygen levels as an alternative to fire suppression methods such as sprinklers and misters. The basic principle is that a lower oxygen environment will not support ignition and so fire is prevented from starting. The air we breathe is about 20% oxygen. The concept for the BL is to hold the storage environment at 15% oxygen, which does not support ignition. This is the equivalent of being at an altitude of 3000 metres. However, it is possible to work in it, if necessary; European legislation varies



**Fig 8** National Library of Norway Mo I Rana, automated storage system. Image reproduced with kind permission of the National Library of Norway.

<sup>19</sup> H. Shenton, 'The future shape of collection storage', *Where shall we put it? Spotlight on collection storage issues*, NPO conference, London, 2004, 4-14. <<http://www.bl.uk/services/npo/pdf/conf2004.pdf>>.

<sup>20</sup> H. Shenton, 'Strategic Developments in Collection Storage', *LIBER Quarterly* 15:3/4 (2005): 200-213.

<sup>21</sup> D. Olney, 'A UK first; an automated high-density solution for the British Library'. *Where shall we put it? Spotlight on collection storage issues*, NPO conference, London, 2004, 58-63. <<http://www.bl.uk/services/npo/pdf/conf2004.pdf>>.

<sup>22</sup> G. Myrbakk, 'Mountain vaults: a thousand years perspective', IFLA, Oslo, 2005. <<http://www.ifla.org/IV/ifla71/papers/153e-Myrbakk.pdf>>.





between allowing four hours and six hours per day. Paper can smoulder at this level but does not support a flame.<sup>23, 24</sup>

There is a potential preservation dividend with storing at lower oxygen levels, not fully proven yet so far as is known. The BL visited IT facilities where nitrogen can also be flooded into the building as back-up fire suppression, should the system fail and there be a fire. Low oxygen is an active system, being constantly monitored, as opposed to a passive sprinkler system that is proven to work only in an emergency. The air tightness of the building is a major issue with low oxygen environments; whilst there is also a 90 hour buffer of the 15% oxygen levels.

The proposed new store will be a single climatic zone with one environmental specification. An outstanding need for the BL will be cold storage for, amongst other materials, its cellulose acetate microfilm collections.<sup>25, 26</sup> The potential need for cold storage in the UK is being researched by the BL as part of the International Roundtable on Microfilm.

The storage building is due to open in about three years' time in Boston Spa in the North of England. Whilst there is specific government funding for the construction costs, there are no specific new funds for all the other costs, such as the preparatory work of cleaning, boxing and moving the 262 linear km of stock, which runs into several millions of pounds. The preparatory work has started and substantial funds from the preservation budget are being dedicated to the storage programme over the next five years.

### Intangible, digital collections

Digital developments are increasingly complementary to paper-based, print material and increasingly intertwined, for example, during a mass digitization project such as the so-called 'Google 5'<sup>27, 28</sup> or the Microsoft® projects.<sup>29, 30</sup>

The range of digital collections confronting the BL include: e-journals; legal deposit of electronic material; digital newspapers (not the digitised versions of hardcopy newspaper, but the pdf stream direct from the newspaper publishers); digitised masters (in theory, the most straightforward 3 million digital surrogate copies of the hardcopy collection items); digital maps and geospatial data; e-theses; grey literature (e.g. conference proceedings); web archiving; e-literature, e-manuscripts, e-correspondence; e-books; born digital audio; databases; and blogs, wikis and digital lives.

### Digital science

In many ways, the sciences are leading the way in the digital arena, for example with the huge amount of data being generated by projects such as the Genome data sets (Genbank) or in the UK the Hubble telescope. Areas such as particle physics are leading the way in changing how researchers work, for example with virtual laboratories, *collaboratories*, and with data sets that all have access to and links to articles; in astronomy there is a virtual observatory for multi-wavelength astrophysics. Tony Hey, now at Microsoft®, but previously director of UK e-Science Core, said in February 2005:

'In the next five years e-Science projects will produce more scientific data than has been collected in the whole of human history.'<sup>31</sup>

Scientific journals published only electronically, with no paper version, are often dynamic publications linked to datasets. These pose huge challenges for digital preservation.<sup>32</sup>

### Digital art

When I worked at the V&A Museum, there was an Artist's Book that was meant to self-destruct on exposure to light<sup>33</sup> and contained a disk that would corrupt after one play. Digital artists are pushing the boundaries, from Hollywood special effects to David Byrne using Power Point to its limits.

The preservation challenge is not only to be able to preserve the look and feel and functionality of the digital art, but also to capture the creative process, which in the past would have been documented through sketchpads and now can disappear at the push of a button.<sup>34</sup>

23 C. Norgaard Madsen, G. Jensen, J. Holmberg, 'Hypoxic air venting—fire protection for library collections', IFLA conference, Oslo, 2005. <<http://www.ifla.org/IV/ifla71/papers/063e-Madsen.pdf>>

24 The Special Collection Library at Groningen University Library in Holland is run at 15% oxygen level, a retro-fitted alternative when the gaseous fire suppression system became illegal, due to changes in legislation. Low oxygen storage has been used by The National Archives and Records Administration in the USA to store the *Declaration of Independence* first in helium in the 1950s and now argon. Anoxic or low oxygen environments are used in museums for deinfestation of, particularly, ethnographic collections.

25 Cellulose Acetate Microfilm Forum website <<http://www.bl.uk/about/collectioncare/acetate/camfintro.html>>.

26 *LIBER Quarterly* 15:2 (2005) contains the papers from the Cellulose Acetate Microfilm Forum, held at the British Library, May 2005.

27 V. Kopytoff, 'Google, 5 big libraries team to offer books Collections will be digitally scanned', *San Francisco Chronicle*, Tuesday, December 14, 2004, <<http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2004/12/14/BUGADABBS91.DTL>>.

28 *Digitisation in the UK—the case for a UK framework*, A Report based on the Loughborough University Study on Digitised Content in the UK Research Libraries and Archives Sector commissioned by JISC and CURL, 7. <[http://www.curl.ac.uk/projects/Digitisation\\_in\\_the\\_UK.pdf](http://www.curl.ac.uk/projects/Digitisation_in_the_UK.pdf)>.

29 <<http://www.bl.uk/news/2005/pressrelease20051104.html>>. Accessed 2006.

30 <<http://news.bbc.co.uk/1/hi/technology/6213260.stm>>. Accessed 2006.

31 T. Hey, e-Science and Open Access, University of Southampton, 2005. <<http://www.eprints.org/events/berlin3/ppts/04-Hey.ppt>>.

32 Digital preservation is not simply digitisation or the production of a surrogate of a physical entity, but the preservation of the bytes and the bitstream which may never have existed in physical format.

33 H. Shenton: Editorial, *V&A Conservation Journal* 15 (January, 1995): 3–4.

34 Another example at the V&A was how to curate and preserve the creative design process of an iconic object such as an Alessi kettle. The challenge was how to capture all the changes in a computer aided design process to show how the thinking had evolved (together with all the balsa wood mock-ups and prototype metal kettles). This would have been possible when designers used sketchpads.

35 A. Low, 'The Conservation of Charles Dickens' Manuscripts', *V&A Conservation Journal* 9 (October, 1993): 4–7.

36 P. Hartzog, 'Social Publishing', Many 2 Many; A Group Weblog on Social Software, September 02, 2006. <[http://many.corante.com/archives/2006/09/02/social\\_publishing.php](http://many.corante.com/archives/2006/09/02/social_publishing.php)>.

37 A. Mislove, K. Gummadi and P. Druschel, *Exploiting Social Networks for Internet Search*, 2006. <<http://www.mpi-sws.mpg.de/~amislove/slides/PeerSpective-HotNets-slides.pdf>>.

38 For an excellent paper on the very wide-ranging implications of digital life stories, see K. O'Hara, R. Morris, N. Shadbolt, G.J. Hitch, W.Hall and N. Beagrie, 'Memories for life: a review of the science and technology', *Royal Society Interface Journal* 3:8 (2006): 351–365. The Memories for Life research network review paper was published in the June issue of the *Journal of the Royal Society Interface* and is currently free to download to non-subscribers as a sample article in pdf or the download is available from html [http://www.journals.royalsoc.ac.uk/\(edbtkybv2awxoe552vocqcbv\)/a pp/home/contribution.asp?referrer=parent&backto=issue,1,11;journal,2,9;linkingpublicationres ults,1:111337,1](http://www.journals.royalsoc.ac.uk/(edbtkybv2awxoe552vocqcbv)/a pp/home/contribution.asp?referrer=parent&backto=issue,1,11;journal,2,9;linkingpublicationres ults,1:111337,1)>. Accessed January 2007.

39 Digital Object Management Programme <<http://www.bl.uk/about/policies/dom/hom epage.html>>.

40 A. Farquhar *et al*, 'Design for the long term: authenticity and object representation in the British Library's Digital Object Management System', IS&T Archiving Conference, (Washington, 2005) 104–108.

41 Web archiving. <<http://www.webarchive.org.uk>>.

42 H. Shenton, 'Life cycle collection management', *LIBER Quarterly* 13:3/4 (2003): 254–272. <<http://liber.library.uu.nl/>>.

43 H. Shenton, 'Real Time, Deep Time, Life Time – Spanning Digital and Traditional Collections Life Cycles', IS&T keynote address, IS&T Archiving Conference, (Washington, 2005) 206–214.

44 H. Shenton, 'Managing the life cycle decisions for the long term use of original collection material and surrogates', NPO & KCL Joint Conference 2003 *Parallel Lives digital and analog options for access and preservation* (London, 2003). <<http://www.bl.uk/services/npo/conf 2003.pdf>>.

45 The recently completed LIFE (LifeCycle Information for E-Literature) project looks at the life cycle costs of digital collections, including, e-journals, legal deposit and web archiving at UCL Library and the BL respectively. <[www.ucl.ac.uk/lifeproject/](http://www.ucl.ac.uk/lifeproject/)>.

## Digital literature

Digital literature is used to mean e-manuscripts and e-correspondence. A literary author's correspondence is as interesting to scholars as manuscripts of their works. In Jane Austen's time, there would have been seven or eight postal deliveries a day in London and the BL has many of her letters. Today, the equivalent is for authors to send e-mails. Where are they now? How can they be preserved for the future? Should they be? Furthermore, the creative process may not be as visible because draft text, re-workings and cancelled text by a contemporary literary author may not have been saved.

Similarly, where once it was possible to trace where Charles Dickens wrote his novels by the physical evidence, such as the different colour of the ink,<sup>35</sup> and the ink in the Codex Sinaiticus is being examined using hyperspectral imaging to help trace the scribal hands, the electronic equivalent is unclear. There are embryonic e-manuscript projects underway at the BL, working tentatively with poets, politicians and contemporary scientists and many issues are emerging, including questions of intellectual property rights and whether the collecting of e-correspondence by the BL would be seen as an endorsement of particular authors. As with so much, it is not a question of *either* paper *or* electronic material, but *both*; the BL intends working with living literary authors who may have begun their careers using typewriters and are now using e-mail.

## Digital lives; digital history

The rise in social publishing<sup>36, 37</sup> and the development in personal electronic portfolios, of personal websites, weblogs, wikis and personal music management can be seen as digital life stories. These developments are changing how history will be studied because they are changing how the contemporary is recorded. A future challenge of studying history will be the sheer volume of material. Our challenge is to preserve this manifestation of the present for the future.<sup>38</sup>

A Digital Object Management programme is underway at the BL.<sup>39, 40</sup> The aim of the programme is to enable the UK to preserve and use its digital output in the long term. The aim of the system is to store and preserve any type of digital material in perpetuity; provide access to users with appropriate permissions; ensure that it is easy to find; that users can view it with contemporary applications and that they can, where possible, experience material with the original look-and-feel. This digital object management programme can be seen as a virtual version of the storage programme above.

The BL is part of a web archiving consortium, in which it is, in the first instance, selectively collecting websites from the UK web space. Once the effective methodology is determined, the BL will also adopt a comprehensive archiving strategy by taking periodic snapshots of the entire UK web presence. In the selection, acquisition, storage and access of archived websites, the BL is taking a collaborative approach with other institutions and stakeholders. There are significant challenges with web-archiving as well as paradoxes, for example, the need to put national boundaries to make manageable, around something quintessentially boundary-less.<sup>41</sup>

The BL is working with Microsoft® in a number of ways, ranging from the digitisation of tens of thousands of out-of-copyright nineteenth-century monographs, to being on the technical committee TC45 that is designing the next generation of Microsoft® Office. If the design of the next generation of Office software can be influenced, some of the future problems of preserving this material may be prevented. That will be a classic case of preventive conservation, parallel to working with papermakers to produce permanent paper.

## Life cycle

The concept that brings conservation *and* preservation of traditional *and* digital collections together is that of life cycle.<sup>42, 43, 44, 45</sup> Life cycle collection management is a way of taking a long-term approach to the responsible stewardship of the BL's collections. It is key because it embeds conservation and preservation within the whole management of the collections and is part of





Fig 9 Life cycle Collection Management. Image reproduced with kind permission of the British Library Board.

creating integrated stewardship (Fig 9).

It defines the different stages in a collection item’s existence over time, ranging from selection and acquisitions processing, through to conservation, storage and retrieval. Life cycle collection management seeks to identify the costs of each stage in order to show the economic interdependencies between the phases over time. It thereby aims to demonstrate the long-term consequences of what the Library takes into its collections, by making explicit the financial and other implications of decisions made at the beginning of the life cycle for the next 100 or 200 years.

Eventually it aims to combine the life cycle of both paper and digital collections, in order to reflect the totality of the BL’s hybrid collections. It is important in that it makes conservation, preservation, storage and all the aspects of caring for a collection indivisible parts of the whole of a library. It is a practical manifestation of the 1972 Act of Parliament that established the BL that spoke of preservation as a core activity. Given the growth in formats, size and complexity of collections with, in most places, steady funding levels, it is all too easy for preservation to be the luxury or optional activity and this life cycle approach demonstrates that it is a core, indispensable function.

The need for active intervention in the beginning of the digital life cycle is often cited, and a phrase used around digital material is, ‘use it or lose it’. However, it is also the most cost effective point in the life cycle for active intervention to prevent damage to physical collections.

There are practical manifestations of how the BL is trying to embed the care of the collections across the whole organization. On entering the BL there is a display for *Adopt a Book*, a scheme that raises funds for practical conservation. Furthermore, *Adopt a Book* is included in every Christmas card, on the bottom of every e-mail and in specialist gift catalogues. There are icons for readers and visitors directing them as to what they can and cannot do, from the first point of contact when getting a readers’ ticket through to when they enter one of the 11 reading rooms (Fig 10). The rotation of the Treasures in the Sir John Ritblatt Gallery is now enshrined for conservation reasons. This has just been introduced with the Lindisfarne Gospels, replaced with explanatory text and a facsimile.<sup>46</sup> Furthermore, the rotation of the treasures in the Gallery will be linked to the new public visitor display area in the BLCC.

**Conclusion**

In conclusion it would seem that we are both people of the book *and* people of the screen, and we should plan for this for at least the medium term. As with previous technologies television did not supplant film; video did not supplant television. It is not a question for the immediate future of *either* conservation of

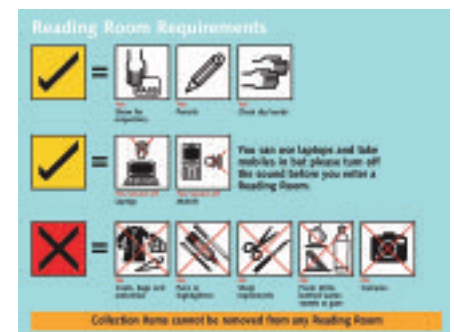


Fig 10 New icons and signs incorporated into Reading Room display panels as guides for readers. Image reproduced with kind permission of the British Library Board.

<sup>46</sup> H. Shenton, ‘Rotating the treasures on display at the British Library’, *ICON News* (London: Icon, July 2006): 28–30.

library material *or* preservation of library material but *both*. Both conservation and preservation are changing and are increasingly complex and interdependent. Furthermore, it is not a question of *either* the conservation *and* preservation of physical, paper-based library material *or* the preservation of digital material, but *both*, with all the attendant preservation and conservation implications of more, different types of material that that entails.

#### Summary

This paper examines the changing nature of, and relationship between, the practical conservation and preservation of the collections in the British Library (BL). The approach is in response to more books being printed than at any point in the history of the world and to an upsurge in multiple forms of digital publishing, from e-journals and weblogs to e-manuscripts. It explains how the British Library undertakes not to do *either* conservation *or* preservation but to do *both* for all of its collections.

Specific new developments in conservation include a new Centre for Conservation due to open in 2007. Specific new developments in preservation include a major building programme of high density, fully automated, low oxygen storage for over 250km of material.

The paper also addresses how the BL is thinking through these challenges and how it is bringing about changes. It illustrates how conservation and preservation are responding to a growing, dynamic, highly-used collection and how the BL is developing a whole-life approach and philosophy to managing the stewardship of its collections.

#### Résumé

Dans cet article, on examine les changements et les relations entre la restauration pratique et la conservation des collections à la British Library. Cette approche répond à une plus grande quantité de livres imprimés qu'à n'importe quelle période dans l'histoire du monde et à une augmentation des multiples formes de publications digitales, de l'e-journal et des blogs jusqu'aux e-manuscrits. On explique comment la British Library entreprend non pas de restaurer *ou* de conserver mais de faire les *deux* pour toutes ses collections.

Les nouveaux développements spécifiques pour la restauration comprennent un nouveau Centre de restauration qui devrait s'ouvrir en 2007. Les nouveaux développements spécifiques pour la conservation comprennent un important programme de construction d'un système de rangement de plus de 250 Km de documents, à haute densité, complètement automatisé et avec une faible teneur en oxygène.

Cet article montre aussi comment la British Library relève ces défis et les changements que cela entraîne. Il illustre comment adapter la restauration et la conservation à une collection en pleine croissance, dynamique et très utilisée et comment la British Library développe une approche globale et une philosophie pour gérer ses collections.

#### Zusammenfassung

Dieser Artikel untersucht die Veränderungen in und das Verhältnis zwischen der praktischen Restaurierung/Konservierung und der Bestandserhaltung in der British Library. Diese Haltung hat sich als Antwort dazu entwickelt, dass jetzt mehr Bücher gedruckt werden als je zuvor und dass auch eine enorme Steigerung der digitalen Veröffentlichungen stattgefunden hat, zum Beispiel durch e-journale, weblogs und e-manuskripte. Es wird vorgestellt, wie die British Library nicht *entweder* Bestandserhaltung *oder* Konservierung/Restaurierung ausführen will, sondern *beides* für alle Sammlungen.

Spezifische Neuentwicklungen im Felde der Konservierung/Restaurierung sind unter anderem ein neues Konservierungs-

/Restaurierungszentrum, das 2007 eröffnet werden wird. Spezifische Neuentwicklungen bei der Bestandserhaltung beinhalten unter anderem ein grösseres Bauvorhaben für eine *high density, low oxygen* vollautomatisierte Lagerungsanstalt für über 250 km von Material.

Der Artikel beschreibt auch, wie die British Library diese Herausforderungen durchdenkt und wie Änderungen eingeführt werden. Illustriert wird auch, wie Konservierung/Restaurierung und Bestandserhaltung auf eine wachsende, dynamische und viel gebrauchte Sammlung reagieren und wie die British Library eine Lebenseinstellung und eine Philosophie entwickelt, um die Zustandserhaltung ihrer Sammlung zu leiten.

#### Resumen

Este documento examina la naturaleza de los cambios y la relación entre la conservación y la preservación práctica de las colecciones en la Biblioteca Británica. Parte de constatar que se están imprimiendo más libros que en ningún otro momento de la historia y del surgimiento de una gran variedad de formas de publicación, desde los e-journals y web-blogs hasta los e-manuscritos. Esto explica porqué la Biblioteca Británica no se plantea hacer conservación o preservación sino que utiliza las dos técnicas en todas sus colecciones.

Los nuevos avances en conservación incluyen un nuevo Centro para la Conservación que deberá abrirse en 2007. El desarrollo de nuevos elementos en preservación incluye un gran programa de construcción de un edificio de alta densidad completamente automatizado; un almacenaje de baja oxigenación con capacidad para 250 kilómetros de material.

El documento también explica cómo la Biblioteca Británica esta abordando estos retos y cómo esta realizando estos cambios. Se ilustra cómo conservación y preservación están respondiendo al crecimiento, la dinámica y el alto uso de las colecciones y cómo la Biblioteca Británica esta desarrollando un abordaje y una filosofía totalmente nueva de manejar y cuidar sus colecciones.

#### Biography

Helen Shenton became the first Head of Collection Care at the British Library in 2002. Helen read English Literature at University College London and trained at the London College of Printing and with the Arts and Crafts book conservator, Roger Powell. She joined the BL in 1998 after 14 years in the Conservation Department of the V&A Museum.

She is currently a Board member of the Digital Preservation Coalition and the National Preservation Office (NPO) and chairs the NPO Preservation Administrator's Panel. She sits on a number of national and international groups, such as IFLA's Preservation and Conservation Committee, LIBER's Preservation Division, Lambeth Palace Library and the Centre for Sustainable Heritage's Academic Advisory Committee.

She has taught and examined Masters degree courses in Conservation and Preservation, and edited journals such as *The Paper Conservator*, lectured and published on a range of subjects, such as national preservation strategies, life cycle collection management and digital preservation. Helen is a Fellow of the IIC and the Royal Society of Arts.

#### Contact address

British Library  
96 Euston Road  
London NW1 2DB  
UK

email: helen.shenton@bl.uk