PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM

THE 3-D'S OF PRESERVATION
DISATERS, DISPLAYS, DIGITIZATION

ACTES DU SYMPOSIUM INTERNATIONAL

LA CONSERVATION EN TROIS DIMENSIONS
CATASTROPHES, EXPOSITIONS, NUMÉRISATION

Organisé par la Bibliothèque nationale de France
avec la collaboration de l'IFLA
Paris, 8-10 mars 2006

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Corine Koch, IFLA-PAC

International Preservation Issues
Number Seven

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International Preservation Issues (IPI) is an IFLA-PAC (Preservation and Conservation) series that intends to complement PAC's newsletter, *International Preservation News* (IPN) with reports on major preservation issues.

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International Federation of Library
Associations and Institutions
IFLA Core Activity
on Preservation and Conservation

Proceedings of the International Symposium
The 3-D's of Preservation
Disasters, Displays, Digitization

Actes du Symposium international
La Conservation en trois dimensions
Catastrophes, expositions, numérisation

Organized by the Bibliothèque nationale de France
in collaboration with IFLA
(IFLA Section on Preservation and Conservation
IFLA Core Activity on Preservation and Conservation)
Paris, March 8th-10th 2006

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and Solange Hernandez (Spanish)

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International Preservation Issues
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PREFACE

L'organisation du Symposium « La conservation en trois dimensions : catastrophes, expositions, numérisation » qui s'est déroulé à Paris du 8 au 10 mars 2006 est le fruit d'une étroite collaboration entre une grande institution, la Bibliothèque nationale de France, et deux sections capitales de l'IFLA, la Section Préservation et Conservation et le Programme fondamental Préservation et Conservation (PAC), éditeur des actes que vous pouvez lire aujourd'hui.

Il se trouve que les numéros précédents de « International Preservation Issues » ont traité les thèmes qui font l'objet de ces rencontres. La gestion des catastrophes nous renvoie au remarquable manuel de John McIlwaine « Prévention des catastrophes et plans d'urgence » publié à l'occasion de ce symposium. La conservation des documents graphiques a été l'objet, en 2004, de IPI n°5, « Entretien, manipulation et rangement des photographies » de Mark Roosa. Enfin, en collaboration avec l'UNESCO, le PAC a publié en 1999 « Survey on digitisation and preservation » (IPI n°2).

Grâce à ce symposium, nous avons essayé d'établir une sorte d'état des lieux en ce qui concerne les nouveaux problèmes posés à la conservation du patrimoine écrit. Les récentes catastrophes au niveau planétaire (Katrina à La Nouvelle-Orléans, le tsunami de décembre 2005 en Asie, la guerre en Irak et le pillage du Musée de Bagdad) ont en quelque sorte remis à l'ordre du jour toutes les réflexions déjà menées au sein du Bouclier Bleu (IPI n°4). C'est la raison pour laquelle la première des sessions est un véritable plaidoyer pour la création de plans d'urgence dans nos établissements culturels.

Comme le fait remarquer Dianne van der Reyden en introduction de sa communication, les bibliothèques sont de plus en plus contraintes à exposer leurs collections car les expositions jouent un rôle fondamental en matière de communication. Aussi, les millions de livres, cartes, manuscrits et photographies exposés chaque année de par le monde requièrent-ils des mesures de protection efficaces.

Enfin, l'accélération vertigineuse de la production de documents numériques et les problèmes liés à leur conservation nécessiteraient presque des explications mensuelles tant les technologies et surtout les masses à traiter changent régulièrement. Aussi, était-il fondamental pendant ce symposium de revenir sur les programmes existants de préservation du numérique et sur les stratégies qui les animent.

A l'évidence, ce colloque ne représente qu'une étape dans les débats suscités par ces enjeux fondamentaux, enjeux qui donneront lieu sans nul doute à bien d'autres rendez-vous que nous souhaitons tout aussi enrichissants.

Christiane Baryla
Directeur d'IFLA-PAC

International Symposium
THE 3D'S OF PRESERVATION: DISASTERS, DISPLAYS, DIGITIZATION
March 8th - 10th 2006
Bibliothèque nationale de France
Paris

The International Symposium, « The 3D's of Preservation: Disasters, Displays, Digitization », was organised by the Bibliothèque nationale de France in collaboration with the International Federation of Library Associations and Institutions (IFLA): IFLA Section on Preservation and Conservation and IFLA Core Activity on Preservation and Conservation (IFLA-PAC).

Le Symposium international, « La Conservation en trois dimensions : catastrophes, expositions, numérisation », a été organisé par la Bibliothèque nationale de France, en collaboration avec la Fédération internationale des associations de bibliothécaires et des bibliothèques (IFLA) : Section Préservation et Conservation et Programme fondamental « Préservation et Conservation » (IFLA-PAC).

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DISCOURS DE BIENVENUE

Agnès Saal, Directrice générale de la Bibliothèque nationale de France a ouvert le Symposium et souhaité la bienvenue aux participants en se félicitant de leur présence à la bibliothèque.

WELCOME

Agnès Saal, Director General, Bibliothèque nationale de France, opened the Symposium. She was very pleased to welcome the participants who came and attended the debates at the library.

Forty Years Outside Looking In: Panaceas, Principles and Pragmatism

Opening speech by John McIlwaine, Professor Emeritus of the Bibliography of Asia and Africa, School of Library, Archive and Information Studies, University College London, United Kingdom

To explain the first phrase of my title, I am not a trained conservator. I have never been responsible in a library or archival context for the preservation management of an institution.

My acquaintance with the issues involved comes entirely from observation, from the literature, and from long contact with the real experts, the conservators, technicians and preservation managers and more narrow specialists, meeting them in libraries and archives, at conferences, and on committees. My interest began with my first professional post just over 40 years ago in the India Office Library & Records, then a distinct collection, and possessing an enormous range of documents, printed and manuscript, paper, palm-leaf, wood, bark, photographs, negatives, all with their own conservation problems. This gave me a particular concern with the conservation of documents originating in the tropics. When I moved to become a teacher in the School of Library & Archive Studies at University College London, because of my and the College's interests in the countries of Asia, Africa and the Caribbean I was able to have the opportunity to visit over 30 different countries in these regions, from the 1980s onwards, not usually primarily in a preservation context, but always looking at the preservation issues, and meeting and talking to former students who were wrestling with the local problems. From the mid 1980s I taught courses in preservation management to both librarians and archivists, from well over 100 different countries; or rather, I did not teach them, in the sense of telling them what they should be doing, but together we tried to identify a wide range of contexts and situations, and attempted to consider the issues involved and to think about possible and affordable actions to ameliorate these.

Out of this experience, I feel that observing from outside gives its own perspectives, free from direct involvement in actual preservation issues, and that after "40 years outside looking in" I can offer some overall impressions and background thoughts for the discussions to come at the symposium proper. In the time available I shall undoubtedly over-simplify some of the issues, in trying to make my points, but as you are all "on the inside" you will know how to make the appropriate allowances. Indeed my paper is really a plea for simplicity in thinking, and my concern is not so much with the problems and activities of the large national collections, but rather with the smaller, less well funded institutions and particularly with those in the so-called 'developing world'.

I initially thought that I would try to frame what I was going to say on the same linguistic structure as the theme of the conference, using further alliteration based upon the latter D.

However I found that the D words that came to mind were very negative, and in the preservation & conservation context totally antipathetic, e.g. dampness, deluge, damage, destruction, degradation, degeneration, deterioration, not to mention dreary, doubtful, desolate, dysfunctional, depressing, delay.

So I moved instead to the letter P: P for preservation of course, but also P for possibilities, P for prevention, P for preparation, P for practical, P for promotion/persuasion/proselyting, a whole set of much more positive and popular concepts.

PANACEAS

My first 'P' word is "Panaceas", and represents the fact that when I look back over the last forty years, I am struck most strongly by the library profession's constant search for universal solutions.

In the 1960s the major implications of the present condition and the rate of deterioration of their collections came more and more to alarm librarians, probably because for the first time definite proofs of some of the causes of decay became readily available in the professional literature. I remember W.J. Barrow coming to address our students in my very first year on the staff, and presenting us with copies of his research reports into the decay of paper. Enemies were all around, and now they had faces and names: acidity, lignin, sunlight, artificial light, damp, moulds, overheated buildings, industrial pollution, careless users, makers of modern paper. Phrases like 'inherent vices', 'the inevitably of decay' and 'slow fires' were used. Alarmed librarians desperately looked for panaceas, universal remedies, all purpose single solutions that could exorcise these demons.

One panacea that already existed of course was binding. Widely applied to both suitable and unsuitable originals it produced rows of easily handled (or not so easily in the case of bound volumes of newspapers) uniform blocks of text that could be tidily shelved and at least concealed the internal decay.

However as institutions realised that degradation behind the boards and spines was still taking place, and also became conscious that the increasing volume of their documentary intake was putting pressure on space, many by the early 1960s were already turning to another panacea, microfilm, the copying of originals into a space-saving and hopefully long-lasting format (although the revelation of the unsociably combustible habits of nitrate film only a decade or so earlier should have carried a warning). Microfilm was in particular seen as a major panacea for what was then normally termed the Third World, where climatic conditions were seen as even less conducive to the survival of paper than in the North. UNESCO led the way in funding mobile Microfilm Units and in donating microfilm cameras to libraries and archives in developing countries. Unfortunately even panaceas need continuing support. I am sure I am not the only one who has seen microfilm cameras sitting unused in their plastic covers, sometimes even in their original boxes in countries of the developing world, the original financial grant having covered only the machine, not the costs of training a camera operator, nor those of raw film, processing equipment and technical support, in the unlikely event that any of these would even be readily available locally. Or again in such countries seeing box after box of microfilm of important sources, filmed abroad and donated by outside agencies, sitting unopened in drawers for the lack of any reading machines.

"Microfilm will last forever" was the cry ('for ever' being usually defined as 500 years) but the accompanying riders ("if the master film is properly processed, stored under optimum conditions, and regularly inspected, and copies are made for actual use") were rarely voiced as loudly. And as we all know, there are still problems with deteriorating films.

Microfilm provided a substitute but it did nothing to prolong the life of the originals (except of course by protecting them from users who would be offered the film instead). So what could be done to reverse or alleviate the decay in originals? Step forward the panacea of deacidification. Given scriptural support by scientific investigations, the great enemy of acid in paper could be at least be neutralised by treating the acidic paper. Treating every individual sheet was however very slow, and therefore expensive. So came the refined panacea of mass deacidification, which could treat the whole volume at once. The phrase has a Messianic ring to it and for a while discussion tended to dominate the professional press, with mantras such as DEZ and Wei-t'o being chanted by their various advocates. Not deacidification, but with a similar potential for 'mass' treatment was the idea of co-polymerisation. By the mid 1990s dreams of really 'mass' treatments (in terms of hundreds of volumes at a time) had faded into costly impracticability, leaving continuing and apparently successful much smaller-scale processes (dealing in tens of volumes) like Book-keeper.

Another panacea for treating originals which had a brief flowering period was lamination. Enclosing the original document in a tissue 'envelope' would protect it from external air borne pollutants and strengthen it for handling. For a while this too was a craze, and sometimes the obvious first step of stabilising the document before lamination was omitted. I can remember being alarmed at seeing palm-leaf manuscripts which had been laminated by a major national collection (which within five years and ever since has denied that it ever implemented this) and in India being proudly shown a 16th century Persian illuminated manuscript which had been laminated and then folded. India was particularly wedded to lamination and tended to regard criticism as the product of cultural bias. Again the process was potentially amenable to automation, and developing 'mass treatment'. Again after a few years it was realised that lamination (and its close cousin encapsulization) were merely useful weapons in the general conservator's armoury rather than the single solution.

A humbler panacea was boxing (using this as a general term for enclosing documents within a box, envelope, file, or other protective housing). As greater awareness grew of the deleterious effects of the chemical reaction between the atmosphere (temperature levels, light, relative humidity, airborne pollutants) and the chemical constituents of documents, so the idea of protecting by enclosing grew. Again, many converts tended to apply the solution uncritically, and to everything. Boxes and envelopes were relatively cheap, even cheaper if only a few standard ready made sizes were employed. So we find the phenomena associated with "one size fits all" – some items squashed or folded into enclosures too small, others rolling about uncontrolled in enclosures too large. Counter-productive too was the instinctive tendency for librarians to feel that by boxing (as in the past with binding) they had solved the problem (even if their newly boxed collections had greatly increased the shelf space required by their collections). Proponents of boxing emphasize that one is only buying time, before eventual treatment of the contents, but many institutions were happy to stop at boxing, or convinced themselves that they could not afford further action, and left further deterioration to go on unseen within the enclosures.

Looking at a different sort of panacea, again related to the storage environment rather than the documents themselves, the HVAC system to protect the collection from the atmosphere by

controlling the **H**eating, **V**entilation and **A**ir **C**onditioning (HVAC). By the 1980s there was plenty of advice available on what were considered the optimum levels of temperature, light, relative humidity, air circulation and chemical constituents of the storage atmosphere and so the panacea was to install or modify a system to produce these levels. If it could be combined with the installation of fire detection and suppression systems as well, so much the better.

One problem was that optimum in fact varies depending on the actual nature of the documents (colour film for example requiring quite different levels from paper) so that ideally several different atmospheres were needed within a single institution. More major problems were associated with the sheer expense of installing ideal systems in existing buildings which had not been designed to accommodate them. Incorporating good HVAC systems into new buildings should have offered a much easier though still expensive path, although not all architects necessarily think of conservation in their design. A colleague on the PAC Advisory Board, Ellen Namhila of Namibia, told us a couple of years ago of how her pleasure at her new National Library building (designed long before her own appointment) quickly turned to horror as she realised the implications in the Southern African summer of a totally glass roof. Encouraging other institutions in the developing world to install sophisticated HVAC systems (even if paid for by a donor agency) was again often counter-productive, given that the frequent absence of local expertise and spare parts gives such systems only a short life. In the National Archives of Barbados the ceilings are disfigured throughout by the enormous metal structure of an HVAC system that has not worked for twenty years. Fortunately the Archives is located in a former leper hospital, a late 19th construction with thick stone walls, deeply overhanging roof, and good ceiling space for air circulation, so that other than employing a couple of fans at the height of the hot dry season it never needed an HVAC system in the first place.

The final panacea that I shall mention is of course one that is itself a topic at this symposium: digitization. As with microfilm we are talking here of creating a surrogate, rather than treating the original. The extra benefit to employing digitisation is of course the huge potential for making the digitized text widely available electronically. The concept of digitization as a panacea is in total harmony with the way we increasingly conduct our lives: shopping on-line, communicating and seeking information on the internet. Today a project to digitize is likely to strike a chord with and unlock the purse strings of a funding body more readily than any other solution to a preservation problem. Yet of course the same questions remain as they did with that other great surrogate process, microfilming. How can one ensure that the digitized files themselves are preserved for posterity; and what can and should one do about the originals?

I will not anticipate the discussion of the digitization issues which will I know be explored in depth on the Friday of this symposium. I will merely emphasize that as with all other panaceas, the full range of issues needs to be considered, as well as the fact that all cures and remedial measures probably have something to offer, but are unlikely to be universally viable or valuable.

Nor will I dwell any further on yet more panaceas that I have observed over the past 40 years, except to say that I was interested to see in the very latest issue of the PAC "International Preservation News" (December 2005), the exploding by Carolyn Baker & Randy Silverman (a speaker at this symposium) of another small but significant long held precept. Apparently making users wear white gloves when handling rare books and manuscripts provides "no guarantee of protection" and indeed may "increase the likelihood of… inflicting physical damage". Yet another panacea is shown to be anything but.

MY SECOND TWO KEYWORDS ('P' words) are closely related and interdependent. "Principles" and "Pragmatism". Or to put it in other (still P words) identifying a philosophy which can lead to the establishment of priorities.

You may have thought you detected a whiff of cynicism in some of the points I made about the Panaceas. I shall hope to demonstrate that I have in fact, especially in the last half of my "40 years looking in" seen many hopeful signs in the thinking of professionals about preservation and conservation issues.

I noted above the fear and alarm that libraries felt in the early 1960s as the evidence of the problems accumulated and was disseminated by the literature and at professional meetings, and as librarians realised that their collections, if simply left on shelves, in cabinets, on databases without intervention would inevitably deteriorate and would probably not survive to be consulted. Cautious optimism engendered over the next 20 years or so by the panaceas and by other activities that I noted earlier, came for many to be succeeded by pessimism:

- as the real and very substantial costs of major conservation programmes became apparent;
- as the panaceas often proved to be less effective and/or more expensive than originally hoped for, and in some cases were proved no more than palliatives so some professionals despaired of having any course of action open to them. I can remember in the late 1980s encouraging a group of archivists and librarians in the developing world to devise preservation policies for their institutions and being told: "why - what is the point? "Things fall apart", (we were in Africa and they were quoting the title of Chinua Achebe's most famous novel) and we will never have the resources to implement anything".

I think my reply at the time emphasised some very simple, inexpensive, and purely practical aspects, such as:

- improve air circulation by opening windows and installing one or two fans;
- hang cheap blinds over the windows;
- implement regular cleaning of stock and storage areas;
- educate staff and users in basic awareness of conservation factors;
- remember that full buckets of water and a working portable fire extinguisher are far preferable to an elaborate fire suppression system non-functioning because of lack of spare parts.

And thinking of it now I am reminded of those inspirational/motivational phrases that you can purchase in handsomely lettered plaques to mount above your desk, phrases like:

- "Doing something is better than doing nothing."
- "Prevention is better than cure."
- "Being prepared is better than being unprepared."

All very trite of course, but also all very true in the preservation and conservation context.

In more recent years I can detect that the successive phases that I outlined above: of alarm, hope and despair have been succeeded by a more positive and practical way of thought.

There are **no panaceas**, but there are now many fairly well understood techniques, approaches and activities that are worth considering for their specific applicability to particular elements within the collections concerned. There is a great deal of discussion and advice available in the professional literature and in my view there has been a major improvement in the presentation of such advice in the last decade.

However good the proffered advice, it cannot be over-emphasised that the development of a proper preservation policy for an individual institution depends upon the specific needs, problems and resources of that institution, and this is now, I think, more widely appreciated than ever before.

The preservation of collections is only one component, important as it is, of the management of those collections. A sensible preservation policy that can be realised can only be arrived at by an institution that integrates its thinking about preservation into its overall collection management and user service policies.

PRAGMATISM AND THE SIMPLE APPROACH

Libraries and archives need to accept right away that for any particular institution, only certain preservation and conservation practices are going to be feasible given the inevitable limitations on resources, technical, human and financial.

Only some parts of the collection, some areas of the building, some aspects of environmental control can be selected for improvement or treatment at any one time.

Therefore decisions will have to be made on priorities:

- what needs to be done first, what needs to be done next, what can, with least damaging effect, be left for the moment;
- what can be done immediately, with existing resources; what will have to await extra funding and support.

Decisions on priorities can only be made once an institution has made a detailed and rational analysis of:

- the needs of its users, the mission of the collection and the relative significance (in terms of the mission and the user's needs) of the various parts of the collection;
- the nature and extent of local preservation problems (the state of the collections, the nature of the building and its location, the environmental conditions);
- the resources (financial, technical, expertise) currently available.

I noted earlier that the quality of the advice available to the professional librarian and archivist had I thought improved considerably in the last ten years.

There has been very much a mood change from experts proffering advice about conservation methods to an emphasis on the need for institutions to carry out detailed self-assessment procedures along the lines I have just discussed, and only then to look at the conservation alternatives. There are now numerous basic primers, succinct, lucid and focussed texts on specific preservation and conservation issues, published (often in both printed form and available on-line) by professional bodies. Two excellent examples among many others are the National Preservation Office in the U.K. which has produced numerous short texts, of which a typical example is *Building Blocks for A Conservation Policy* by my former colleague Mirjam Foot, a masterly instance of what one can say in just a dozen pages; and the **N**ortheast **D**ocument **C**onservation **C**enter (NEDCC) in the U.S. which among other sources provides both a 412 page manual entitled *Preservation of Library & Archival Materials* (1999) and also the same text in both printed and on-line form broken up into 60 bight-sized guides.

In a sense there is now too much useful information available for the librarian and archivist to find and select. This is why one of our sponsors today, the IFLA Section on Preservation and Conservation, exactly a year ago (March 2005) completed its register which listed and provided comment upon the available *Standards, Codes of Practice, Guidelines, Recommendations and Similar Works Relating to Preservation & Conservation in Libraries & Archives* published in the years since 1995. This can be found on the Section's website under the title "First do no harm …" and will be regularly updated.

Outstanding amongst attempts to give practical and pragmatic advice is the work of another of our hosts today, the PAC Core Activity. Under Marie-Thèrese Varlamoff it has always endeavoured to keep it simple, and to "spread the word" by providing basic information and encouragement to institutions of all sizes around the world. The *IFLA Principles for The Care and Handling of Library Material*, a masterly and accessible summary originally published in 1998, has so far been translated into 14 languages, with at least another four anticipated. It declares its intention to give "basic information to assist libraries in establishing a responsible attitude to looking after their collections … [and] to formulate a positive policy for the future of their materials". PAC have also published to coincide with this symposium *IFLA Disaster Preparedness and Planning: A Brief Manual* (text in English, French and Spanish) which attempts to be a basic primer for libraries and archives thinking about preparing for disasters. To quote from its introduction: "These guidelines are not intended to provide a specific model to be followed: rather they identify questions that each institution should consider while drawing up its own individual plan, and to which they should devise answers corresponding to their own perceived needs and circumstances". And again "These guidelines fully appreciate that in many countries resources may be inadequate to implement many of the suggestions made. A distinction is therefore made in recommendations between use of the term 'ensure' (meaning "Make every attempt to follow") and the terms 'consider' or 'if possible' (meaning that the recommendation which follows is significant but it is realised that in many instances it may not be affordable or otherwise possible).

So, the stress of the PAC Core Activity has been on pragmatism, rather than on panaceas. Ultimately, at the end of my 40 years looking in, I feel optimistic, provided librarians and archivists are prepared to analyse their circumstances, and take advantage of the advice and the processes on offer. I am optimistic too that this Symposium, however deep and penetrating its deliberations, will continually keep in mind the art of the **Possible**.

THE FUTURE OF PRESERVATION

Keynote Address by Deanna B. Marcum, Associate Librarian of Congress for Library Services, Library of Congress, Washington, D.C., U.S.A.

In the Ostrogothic Kingdom in Italy in the Sixth Century A.D., a high official named Cassiodorus wrote about the earlier invention of papyrus with all the eloquence of some computer enthusiast in our time writing about the invention of digital media. Here, in English translation, is what Cassiodorus wrote:

"Then was papyrus invented, and therewith was eloquence made possible. Papyrus, so smooth and continuous, the snowy entrails of a green herb; papyrus which can be spread out to such a vast extent, and yet be folded up into so little space; papyrus, on which white expanse the black characters look beautiful; papyrus which keeps the sweet harvest of the mind and restores it to the reader whenever he chooses to consult it; papyrus which is the faithful witness of all human actions, eloquent of the past, a sworn foe of oblivion."(1)

"A sworn foe of oblivion?" Only a fraction of what the ancient world committed to papyrus has come down to us. The heat and humidity of the Nile Delta have seen to that, along with vandalism, fire, and other catastrophes, natural and human, that erased so many records on papyrus from the ancient empires of Persia, Greece, and Rome. No insignificant part of what we know about the Egypt of the pharaohs comes from discarded records on papyrus that survived only because they were stuffed in mummies, particularly those of holy crocodiles – what a preservation technology!

No, preferable as papyrus was over tables of clay and wood as a communications medium, relatively few of the millions of messages recorded on 'the snowy entrails' of the 'green herb' have survived catastrophic destruction and natural disintegration, to the great regret of historians ever since.(2) Papyrus was a useful medium, but far from eternally durable. Oh, Cassiodorus, if only you had realized!

But are we any different? Our libraries are full of the glorious communications technologies of the modern era – that is, of acidic paper, of fragile film, and, increasingly, of unstable magnetic media containing all kinds of electronic documents. Like Cassiodorus's papyrus, all are headed for oblivion without much more care than we have been able so far to give them.

Please consider the following from our experience in America.

In 1986, the same year in which IFLA created its Preservation and Conservation Core Program, a Committee on Preservation and Access in the United States made a report entitled, *Brittle Books*. It said, in a nutshell:

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1. POSNER, Ernst, *Archives in the Ancient World* (Chicago: Society of American Archivists, 2003), p.186. Reissue of the 1972 original, which modified the English translation from Thomas Hodgkin, ed., *The Letters of Cassiodorus* (London, 1886).

2. POSNER, *Archives*, pp.71-72, 88, 119-120, 137.

"The paper in most books published, worldwide, for the past 125 years is acidic and the content of most of those books will become increasingly inaccessible unless their texts are reproduced."[3]

Scientist and library school dean Robert Hayes initially estimated that some ten million volumes were already at risk or would become so within the subsequent twenty years unless transferred to a more stable medium.[4] Given the magnitude of this concern, the committee became the Commission on Preservation and Access, charged with promoting action to save brittle books.

After publicizing the problem and encouraging the adoption of new standards for the durability of book paper (as IFLA-PAC has been doing in the world at large), the Commission and others persuaded the Congress of the United States to establish a nationwide program for the preservation microfilming of brittle books. Beginning in 1989, the Congress provided annual appropriations to the program, administered by the Office of Preservation of the National Endowment for the Humanities, a government agency, which has provided grants to libraries to do the microfilming. The program's goal was to microfilm three million volumes within the subsequent twenty years, that is, by the end of 2008.[5]

We are now in the program's eighteenth year. As of January 30, 145 libraries and library consortia across our country had participated in the effort to microfilm brittle books and serials. When currently funded projects are completed, the number of embrittled volumes preserved by the program will total 1,094,650,[6] which is a lot. But it is only slightly more than one-third of the program's three-million goal.

Why, after such concerted effort to launch a national program, has this initiative withered? No doubt, the development of digital information technology and online library access are largely responsible. How could preservation librarians, whose ears already were full of the complaints of researchers about using cumbersome, eye-straining microfilm, ignore the popularity of the new medium? As a working group of the German Research Association wrote in a report in 1996, translated into English in 1997:

"Digitization is no doubt the issue that most fascinates and haunts preservation managers in archives and libraries at the moment. The possibilities seem limitless, the advantages are obvious, and from all sides there is pressure to exploit the new medium for preservation purposes, sometimes to the extent that funds are earmarked for digitization that might previously have been allocated to microfilming or conservation..."[7]

Roughly eight years later, in June 2004, as digitization of library resources mushroomed, the **A**ssociation of **R**esearch **L**ibraries in the United States (known as ARL) formally recognized digitization as an acceptable method of reformatting fragile materials, for preservation as well as

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3. Committee on Preservation and Access, *Brittle Books, Reports* [sic] *of the Committee on Preservation and Access* (Washington, D.C.: Council on Library Resources, 1986), p.21.

4. Committee on Preservation and Access, *Brittle Books*, p.8. The books figure is given as 12 million rather than 10 million in NICHOLS, Stephen G. and SMITH, Abby, *The Evidence in Hand: Report of the Task Force on the Artifact in Library Collections* (Washington, D.C.: Council on Library and Information Resources, Nov. 2001), p. 21.

5. "$12.5 Million Approved for N.E.H. Preservation Program," *Commission on Preservation and Access Newsletter*, N°5 (Oct. 1988): 1.

6. E-mail message to Gerald George from Ralph Canevali, acting director, Division of Preservation and Access, National Endowment for the Humanities, Jan. 30, 2006.

7. WEBER, Hartmut and DÖRR, Marianne, "Digitization as a Means of Preservation? Final report of a working group of the Deutsche Forschungsgemeinschaft (German Research Association), translated by Andrew Medlicott (Amsterdam: European Commission on Preservation and Access, Oct. 1997, republished by the U.S. Commission on Preservation and Access, 1997): http://www.clir.org/pubs/reports/digpres.html, accessed Jan. 2006.

access. A report from the ARL's Preservation of Research Library Materials Committee noted that "no one solution can fit all needs," but declared that "digital reformatting should now be considered a valid choice among the various methods for preserving paper-based materials."[8]

Why? As the German group had said, scholars and students were increasingly expecting to access their research resources electronically. Indeed, materials left in non-digital formats, such as microfilm, were in danger of being ignored, 'orphaned', as one writer put it. Moreover, digital technology could capture features not easily reformatted with other technologies, and could generate multiple copies on paper and on microfilm, if desired. Additionally, the ARL committee argued, the library community had learned that digital "files can be preserved in the short term."[9]

Yes, but what about preservation for the long-term? Well, the ARL report answered, the short-term strategies "are a bridge to the emerging solutions that are being developed to ensure long-term availability and access" - that is, a bridge to something hoped for rather than in place. The report admitted that "standards, guidelines, and best practices for producing and maintaining digital facsimiles for the long-term are in the development stage." But, citing techniques such as refreshing and migrating data, maintaining redundant digital files, and emulating obsolete computing systems, the report insisted that, "best practices are in place to ensure that digital objects are being managed in such a way that keeps them safe now and allows us to implement long-term strategies as they emerge."[10] The report further minimized the long-term preservation problem by flattering libraries for their historical ingenuity, as follows:

"Ensuring high-quality image capture and providing for the long-term viability of digital objects is an admitted challenge, but the library profession has a long history of developing standards and best practices in order to support sustainable operations and facilitate inter-institutional collaboration. This tradition provides confidence that digital preservation challenges will be met."[11]

In short, we kept on producing digital resources because we had to while whistling in the dark about their long-term preservation.

Today the ARL's Committee on the Preservation of Research Library Materials no longer exists as a separate committee. Preservation concerns have been folded into ARL's Scholarly Communication initiative. Today the National Endowment for the Humanities makes microfilming grants out of a Division of Preservation and Access, which also supports digitization projects – that is, "digitization of collections to enhance their accessibility."[12] The Endowment's budget has gone up and down over the past ten years or so,[13] as has the number of volumes that U.S. research libraries have annually microfilmed.[14] In contrast, over the decade ending in 2004, research libraries' expenditures on electronic materials have 'grown sharply', three to ten times faster than expenditures on library materials overall. The average

8. ARTHUR, Kathleen, et al., "Recognizing Digitization as a Preservation Reformatting Method," a report prepared for the ARL Preservation of Research Library Materials Committee, June 2004: http://www.arl.org/preserv/digit_final.html, accessed Jan. 2006.

9. ARTHUR, "Recognizing Digitization." For 'orphaned', the report cites an e-mail message it received on March 29, 2004, from Abby Smith, then director of programs for the Council on Library and Information Resources.

10. ARTHUR, "Recognizing Digitization," appendices 2 and 3.

11. ARTHUR, "Recognizing Digitization."

12. NEH description of grant categories: http://www.neh.gov/grants/guidelines/pcahc.html, accessed Feb. 2006.

13. KYRILLIDOU, Martha and YOUNG, Mark, *ARL Preservation Statistics 2003-04, A Compilation of Statistics from the Members of the Association of Research Libraries* (Washington, D.C.: ARL, 2005), p.6.

14. KYRILLIDOU and YOUNG, ARL *Preservation Statistics*, p.14.

member library of ARL "now spends over 31% of its materials budget on electronic materials," and for fourteen major research libraries in the U.S. the figure exceeds 50%.[15]

On top of this growth, plans are abundant for additional, ever-larger digital libraries. Here in Europe, the Conference of European National Librarians recently launched The European Library, TEL, which will establish a single access point to digital holdings "spanning a range of collections in all the partner national libraries." At least nine European libraries are participating by making accessible eleven million records and digitized items from 150 collections.[16] Many of these libraries already have built their own digital collections, such as Gallica here in France's Bibliothèque nationale. Our National Science Foundation in the United States is collaborating with the governments of India and China to finance the digitization by 2007 of a million books. The Google company has announced a program to digitize all or large parts of five major libraries in the United States and the United Kingdom. Other search companies are supporting the new Open Content Alliance to digitize certain libraries and archives in the U.S., Canada, the U.K., and continental Europe. The Digital Library Federation in the United States is creating Project Aquifer to make digital library resources from several libraries available through a single portal as if all were from one large library. And just last winter, we at the Library of Congress announced fundraising to support creation of a World Digital Library as a non-exclusive partnership among major libraries in every area of the planet.

With all this investment in digitization, what happens in the future to library preservation – preservation of digital and traditional materials?

I am pleased to say that in spite of the cautionary tale I have been telling so far, there is hope for progress in preservation in the future. One preservation leader, the one we honor with this symposium, Marie-Thérèse Varlamoff, has been undeterred by fads and trends. She understood in a fundamental way that digital preservation is not a substitute for traditional preservation. She has been a one-woman band in the crusade to enable all libraries to carry out basic preservation of their collections. In addition, a number of the world's libraries are working hard on preservation concerns. You are aware of important work done by PADI, the **P**reserving **A**ccess to **D**igital **I**nformation initiative of the National Library of Australia; by JISC, the **J**oint **I**nformation **S**ystems **C**ommittee, which conducts digital preservation initiatives in the United Kingdom; by the Dutch National Library in such projects as its creation of a repository for Elsevier journals; and here in France, where the Bibliothèque nationale, among other things, participates in the International Consortium for the Preservation of the Internet. These are but a few examples.

I am heartened also by work going on in my own country, where several libraries and scientific organizations are collaborating with the Library of Congress in the program we call NDIIPP. That stands for **N**ational **D**igital **I**nformation **I**nfrastructure and **P**reservation **P**rogram, which has been created and generously financed by the United States Congress. I won't say more now because you will hear about NDIIPP's progress from my colleague Laura Campbell in the panel that follows me. On that panel you also will hear from our friends in France and the Netherlands about their work on "safeguarding digital heritage," which is the title of the panel's program. Concerning long-term digital preservation, I will simply say that we no longer are just whistling in the dark.

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15. KYRILLIDOU, Martha and YOUNG, Mark, "ARL Library Trends," *ARL Statistics 2003-04:* http://www.arl.org/stats/arlstat/04pub/04intro.html, accessed Feb. 2006.

16. "The TEL Vision," http://www.europeanlibrary.org/tel_vision_111102.htm.

What I hope for the future is that we will remember also to preserve traditional resources that remain valuable for study and learning, now and for generations to come. Let's leave the digital area momentarily and look into future prospects for preserving paper resources, such as brittle books, visual resources, such as photos, films, and videos, and sound recordings of various kinds.

Concerning brittle books, the current strategic plan adopted by the National Endowment for the Humanities declares that it will "support the preservation of and expanded access to the content of brittle books, United States newspapers, and other historically significant materials" through the fiscal year 2009.(17) Presumably that means it will continue to make grants to American libraries to microfilm brittle books to the extent that money continues to be appropriated by our Congress.

In the meantime, libraries and other organizations are extending the life of books in another way – by using mass deacidification. Deacidification has been undertaken in Canada, China, France, Germany, Japan, the Netherlands, Switzerland, South Korea, and the United Kingdom, among others.(18) In the U.S. Library of Congress, we have used deacidification technologies to extend the useful life of more than one million bound volumes, approximately as many as had been microfilmed through the program of our National Endowment for the Humanities that I mentioned earlier. Additionally, using a new, single-sheet treatment cylinder, we have deacidified more than two million sheets of manuscript material.(19) Thus we are advancing toward the goal of our Mass Deacidification Plan to stabilize more than thirty million books and manuscripts within thirty years. Many libraries now have the technologies to progress in arresting the embrittlement of books if our governments continue to support deacidification programs.

But what becomes of the original items that we microfilm and/or digitize? Not every library needs to retain every printed book and journal that is reformatted, but retaining some artifact copies remains important, and print access may yet be needed, particularly if redigitization should become necessary. Here, too, there is some progress. For example, in the United States, Harvard University and the University of California announced last fall a plan to create print journal repositories in partnership with JSTOR, our nonprofit organization that provides electronic access to back issues of many scholarly journals. The plan is to assemble, validate, and preserve in special repositories the printed copies of many complete journal sets.(20)

Such repositories for bound journals and books are increasingly outside of main libraries, in auxiliary facilities where temperature and humidity can be more closely controlled. That, in itself, will help to extend the longevity of paper-based materials.(21) Attention to such basics as controlling climate in storage areas will continue to be essential in preserving collections. We must also remain concerned about the bindings of our books. Over the past half-century we have seen a huge increase in books with soft covers that were not designed to endure.(22)

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17. National Endowment for the Humanities, *Strategic Plan, FY 2004-2009:* http://www.neh.gov/whoweare/strategicplan.html.

18. L.C. Preservation Directorate, "Caring for America's Library, 1989 – Present" Web page: http://www.loc.gov/preserv/history/1989topresent.html, accessed Jan. 2006.

19. *Annual Report of the Librarian of Congress for the Fiscal Year Ending September 30, 2004* (Washington, D.C.: Library of Congress, 2005), pp.86-87.

20. KIPLINGER, John, "Print-Repository Effort Under Way at UCLA and Harvard," *CLIR Issues*, n°47 (Sep./Oct. 2005): 1, 3.

21. NICHOLS, Stephen G. and SMITH, Abby, *The Evidence in Hand: Report of the Task Force on the Artifact in Library Collections* (Washington, D.C.: Council on Library and Information Resources, Nov. 2001), p.20.

22. NICHOLS and SMITH, *The Evidence in Hand*, p.19, 22-23.

And a substantial percentage even of hard-bound books, if often used, eventually need repair.[23] New preservation needs in the digital era does not relieve us of traditional conservation and preservation requirements.

Let us turn now from printed resources to newer media apart from the digital. We all now recognize, for example, the importance of preserving many kinds of sound recordings. We cannot listen to the famed orations of Demosthenes and Cicero; we cannot analyze how Beethoven or Chopin themselves played their enduring works for piano; we cannot hear the pronouncements of Charlemagne or Napoleon. But scholars and students now can directly experience much from the late-nineteenth and the twentieth century through our historical gold mine of audio recordings – the music, speeches, radio broadcasts, interviews, and other aural communications captured on cylinders, discs, and tapes. Future generations also will be able to hear expressions of our era – if we can preserve such media.

Doing so will be a major job for librarians in the future. Already we have lost a lot through destruction or neglect of tapes, disks, and other recording media. Nonetheless, in the United States for example, experts believe that 7,000 cylinder recordings, commercially produced in the 1890s, still exist, along with some 360,000 commercial recordings of various kinds issued prior to 1965.[24] Additionally, we still have and must preserve many non-commercial recordings made by scholars, such as Cornell University's recordings of bird sounds, the whale sounds collected by the Scripps Oceanic Institute, and materials collected by ethnographers, folklorists, and linguists in countries throughout the world.[25] As in digital preservation, we are challenged not only by fragile media – such as deteriorating tapes that contain sound recordings – but also by the obsolescence of machines for recording and playing back sound recordings. Industry has been abandoning traditional sound technologies in favor of digital recordings.[26]

We have learned much about how to preserve sound recordings; the largest problem has seemed to be getting sufficient preservation funding. However, two recent studies, commissioned from the Council on Library and Information Resources in the U.S. by our Library of Congress, have identified another major inhibition – the restrictions of copyright. The Congress of the United States, in 1972, extended federal copyright protection to sound recordings that were made in the U.S. after that date. Anything recorded in the U.S. before 1972 remains protected by what one expert has called "a patchwork of state laws, civil and criminal"[27] and will not enter the public domain until the year 2067, more than a half-century from now. That applies, of course, to the recordings themselves. A different copyright law also restricts reproduction of the 'underlying works' - that is, the musical or verbal compositions that are recorded.

Under the law, a recording can be copied if the original is in an obsolete format, but 'obsolete' means only that the device necessary to play it is no longer commercially available. That rules out copying thousands of long-playing and 78-rpm records because one still can purchase turntables that can play them. Many recordings worthy of preservation have not been reissued or reformatted.

23. NICHOLS and SMITH, *The Evidence in Hand*, p.23.

24. BROOKS, Tim, *Survey of Reissues of U.S. Recordings* (Washington, D.C.: Council on Library and Information Resources and the Library of Congress, Aug. 2005), pp.11-12.

25. NICHOLS and SMITH, *The Evidence in Hand*, p.38.

26. STORM, William D., *Unified Strategy for the Preservation of Audio and Video Materials* (Washington, D.C.: Library of Congress Preservation Directorate, 1998), p.6. Also see Nichols and Smith, *The Evidence in Hand*, p.38.

27. BESEK, June M., *Copyright Issues Relevant to Digital Preservation and Dissemination of Pre-1972 Commercial Sound Recordings by Libraries and Archives* (Washington, D.C.: Council on Library and Information Resources and the Library of Congress, Dec. 2005), p.2.

For that reason, our Congress passed the National Recording Preservation Act of 2000, calling for a study of "copyright and other laws applicable to the preservation of sound recordings."[28] The act enabled the Library of Congress to establish a National Recording Preservation Board, which is commissioning several reports needed to enable us to prepare a "comprehensive national plan for audio preservation."[29] One of the first reports reached the following conclusion:

"With the exception of recordings of a few companies whose assets have been abandoned or donated to the public, there are virtually no public domain U.S. sound recordings... Because only the copyright owner can legally make old recordings available, historical recordings are at risk of physical loss as well as of passing, unnoticed, from the nation's aural memory..."[30]

In the words of another of the new studies, there is "clear evidence of the need for updating copyright law to take advantage of digital technologies to preserve and to make accessible the full range of our sound heritage."[31]

Can anything be done under such obstacles? Yes, within limits. The experts advise libraries and others to focus on projects involving no or few third-party rights and limit dissemination.[32] Such measures, it is argued, "could reduce the risk of commercial harm to the right holder and increase the likelihood that the activity would be deemed privileged if a claim were to be asserted."[33] But the preservation of sound recordings in the future will remain inhibited, at least in my country, unless adjustments occur in copyright laws.

In the meantime, however, we at the Library of Congress are doing something else to preserve sound recordings - and to preserve photographic formats, another great kind of documentation of the modern era. Thanks to support from the Packard Humanities Institute, we are building a National Audio-Visual Conservation Center, in the town of Culpeper in the state of Virginia. Eventually the Library of Congress will move there its Motion Picture, Broadcasting, and Recorded Sound Division.[34]

Much of what I have said about preservation of sound recordings could also be said about the preservation of film – that is, photographs, moving pictures, and videotapes. We have all learned of the fragility of film and of the need to protect films from mechanical damage when running a reel through a projector, and to reformat films to rescue them from flammable film stock. We have also recognized that the preservation of film begins with raising awareness and locating what still exists outside of libraries to be saved. For want of such searches previously, America has suffered what one report calls a "catastrophic loss of silent film."[35] But thanks to other countries in the world, such as Australia and the Czech Republic, where American film copies have turned up, we now can preserve films that were lost in our own country.[36]

Film-making studios themselves are taking better care of their products, recognizing that old films and photos can retain value as commercial assets. Also, at the Library of Congress, we now have a National Film Preservation Plan, sponsored by a National Film Preservation

28. Pub. Law 106-474. See Besek, *Copyright Issues,* p.vii.
29. BESEK, *Copyright Issues*, p.vi.
30. BROOKS, *Survey*, p.6.
31. BESEK, *Copyright Issues*, p.vii.
32. BESEK, *Copyright Issues*, p.43.
33. BESEK, *Copyright Issues*, p.43.
34. *Annual Report... 2004*, p.44.
35. NICHOLS and SMITH, *The Evidence in Hand*, p.35.
36. NICHOLS and SMITH, *The Evidence in Hand*, p.36.

Board to preserve historically significant films, non-commercial films in particular. Nonetheless, one could say about preserving all kinds of film what one author has said about videos in the following quotation:

"For anyone concerned about the future of our cultural legacy as recorded on videotape – whether it be the video artist whose early work will no longer play or the archivist with thousands of tapes to maintain – the challenges of video preservation are considerable, the responsibility awesome, the problems numerous, the resources spare, the urgency great."[37]

Concerning all media, I conclude that the future of preservation for library collections depends on our ability as librarians to keep raising awareness of preservation needs, to keep persuading society to invest in the prevention of significant losses, to keep processing our preservation backlogs with today's proven techniques while working to develop even better ones, and to integrate the preservation of digital with traditional resources. We must remain stewards of all parts of our collections and understand their inter-relationships, particularly in national libraries, which have full-range collecting and preserving responsibilities. We must remember that the most basic preservation techniques – protective storage, climate control, disaster planning – remain as important as the newest mass deacidification cylinders and digital migration methods.

The future of preservation also depends on our ability to keep ourselves from being overwhelmed by digitization. Right now our ability – and desire – to create digital resources is far outrunning our ability to preserve them. I hope that a thousand or so years from now, historians will not have to say, looking back at us as we do at Cassiodorus – "Oh, if only in their enthusiasm for the new medium, they had paid more attention to its fragility, and to the cultural value of preservation for our century as well as for theirs, and for all the centuries in between."

I now join you in looking forward to hearing what progress our colleagues on this morning's panel are making in digital preservation. All of us must look to their work with great hope. Thank you.

37. BOYLE, Deirdre, *Video Preservation: Securing the Future of the Past*. New York: Media Alliance, 1993. (Quoted in Nichols and Smith, *Task Force*, p.33.)

Session 1

March 8th, 2006

DISASTERS: THE DIFFERENCE BETWEEN PLANNING AND EXPERIENCE
CATASTROPHES : DU PLAN D'URGENCE À L'EXPÉRIENCE VÉCUE

Moderator: Marie-Thérèse Varlamoff
IFLA-PAC (Preservation and Conservation) Director

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* Ximena Cruzat A., National Library of Chile
The Never-ending Challenge: Disasters and Preservation in Chile
L'éternel défi : catastrophes et conservation au Chili

* Per Cullhed, Uppsala University Library, Sweden
Foreseeing and Dealing with The Unforeseen – Library Disasters in Perspective
Anticiper et gérer l'imprévu : un regard sur les catastrophes dans les bibliothèques

* Sarah-Jane Jenner, British Library, United Kingdom
From Disaster Plan to Action Plan
Du plan d'urgence à l'expérience vécue

* Josiane Laurent, Bibliothèque nationale de France
Le plan d'urgence de la Bibliothèque nationale de France
The Disaster Plan at The National Library of France

* Randy Silverman, University of Utah, USA
Towards A National Disaster Response Protocol
Pour un protocole national de mesures d'urgence en cas de catastrophe

The Never-ending Challenge: Disasters and Preservation in Chile

Ximena Cruzat A.
Director
Biblioteca nacional de Chile

Towards Institutional Awareness: A Brief History of the Process of Preservation and Conservation in Chile

Based on a series of recommendations made by the Head of Conservation at the National Library of France, Jean-Marie Arnoult, who visited Chile in 1988, the Chilean National Library created its own Conservation Unit. Thus began a long process, first of training in conservation, followed by the reproduction and re-formatting of deteriorating books and manuscripts.

Later, in October 1994, with the selection of new personnel through the ICCROM and the National Centre for Conservation and Restoration, administrated by the DIBAM, Chile's Directorate of Libraries, Archives and Museums, the Conservation Laboratory was strengthened, and their workload was significantly increased.

One emblematic project in this process took place in the José Toribio Medina Collection, the most valuable collection in our library, with more than 45,000 items, including manuscripts, and first editions and printings of Latin American literature.

Later, in 2000, we carried out an overall diagnostic of storage and conservation on our collections, to formulate a plan to confront issues that had come up and chart out institutional policies to manage these issues. One important aspect of this effort has been the participation of handicapped young people, who receive training in basic conservation methods and then work occasionally in the department. This effort has yielded very good results.

Over the years, the Conservation Unit continued working on a variety of tasks, such as storing books and newspapers on microfilm, while taking on new, important projects related to valuable collections and keeping tabs on the state of the entire collection. It maintained optimum conditions for the storage of important historical objects. I should point out that a large number of workers have received training in different areas such as risk prevention, preservation, microfilming and storage, among others.

In the year 2000, the National Library began the process of digitizing heritage collections, with the twin objectives of preserving and disseminating our bibliographic heritage. The "Memoria chilena" or "Chilean memory" web project – www.memoriachilena.cl – which includes the "Chile para niños" or "Chile for children" website – www.chileparaniños.cl – includes more than 900,000 digitised web pages. It won the Digital Challenge Award in Stockholm in 2004, for best cultural website in Latin America; aside from the amount of resources it makes available online, its interface and presentation allow users better access to our identity and cultural heritage.

The following are some of the major challenges and problems we have encountered in this short period of time.

- A lack of national, collective awareness of disaster prevention measures, with the exception of small groups committed to this matter for different reasons.
- The failure to remember different instructions and procedures to follow in case of internal emergencies.
- Psychological behaviour becoming erratic in emergency circumstances, leading to inadequate responses to crises.
- Excessive internal bureaucracy in the funding allocation process.
- Lack of awareness about the conservation and preservation of digital heritage.

However, there have been positive aspects along the way as well, including a growing sense of enthusiasm at different levels of society.

PROGRESS: THE FIRST STEPS FORWARD AND IFLA-PAC

When the Chilean National Library was named the regional centre of operations (2003) to carry out projects proposed by the IFLA-PAC, coordinating Peru, Ecuador and Argentina, we focused our efforts on the following areas.

Forming a working committee to represent different areas;

- collecting internal and international information about the issue;
- receiving the heads of the IFLA-PAC;
- formulating an action plan;
- calling for the commitment of the community and the authorities to the task;
- holding a selection process for the National Centre for Restoration and Conservation;
- working with the Joint Committee for Hygiene and Safety.

In 2004, we formed the National Blue Shield Committee.

In October 2005, we hosted the International Blue Shield Conference in Santiago, Chile.

DISASTER PREVENTION

The Chilean National Library has taken measures to formulate and implement a disaster and emergency preparedness plan, in three basic areas.

1. Working with the Joint Committee for Hygiene and Safety

This committee, whose existence has been required by Chilean law since 1968 for the private sector and since 1995 for the public sector, ensures workers' safety and well-being, with particular emphasis on disaster prevention. This includes patrimonial property, including both the building itself and the equipment inside. The law requires that such committees be formed in all buildings in which more than 25 people work. That is why our institution has a team of employees that spend part of their day working on the committee, in accordance with the law. The structure, experience and training that this committee has supplied us have been key elements of our efforts to increase awareness of disaster prevention and emergency procedures in the library's collections.

Along with the committees and brigades already in operation, we worked to reinforce what we had done by emphasizing the collections and the building. The Collections Brigade is one result of these efforts.

There is currently information in each section of the Chilean National Library about measures that can and should be taken in the event of an emergency, such as:

- maps showing the locations of fire extinguishers, which themselves are periodically inspected;
- safety zones;
- evacuation instructions and maps;
- first aid kits;
- emergency preparedness guidelines;
- the Evacuation Plan, a document written in 2003.

Setbacks in this area have included high employee turnover, meaning that a constant influx of new employees need to undergo a long process of emergency preparedness training. New firefighters working in the area must also participate in this process.

2. The emergency preparedness guidelines were written following the recommendations of the National Preparedness Institute (a national organization specializing in safety), the Chilean Fire Department, the "Carabineros" police corps and the Civil Defence Corps, as well as the Centre for Conservation and Restoration. Young people studying to be safety engineers at the DUOC Institute, part of the Catholic University of Chile, the country's second most important institution of higher learning, worked as interns on this project as well.

Brochures have been printed, with translations, and courses of different types have been offered to our employees, and more details about this effort are available on the IFLA website. Once the plan has been consolidated, it will be instituted in other places as well. Work on this expansion has already begun.

A problem we have had to face has had to do with the selection of employees qualified enough to carry out these tasks. As we all know, common sense tends to disappear during emergency situations, and panic and misinformation reign. In order to address this issue, we need to implement, for one thing, a coded alarm and speaker system in order to better communicate what tasks each person must do in an emergency situation.

3. Working with the community

First, library patrons have been called upon to participate in the process, in meetings open to the general public and meetings with specific groups; meanwhile, progress and achievements we have made have been put on display. We have worked with different authorities, with positive results - heritage organizations both in Santiago and throughout the country. We will go further into depth in a section about the Blue Shield programme.

We have also served as a regional headquarters within South America, coordinating work in other countries around us. We first focused on putting together the most rigorous board of directors possible, making sure that both heritage preservation organizations and people knowledgeable about the issue were represented. We initially contacted the most well-known institutions in this area, but we received the most interesting responses from more low-impact, local heritage organizations. We have learned from our experiences that we need

to strengthen local and regional institutions in the future, because their enthusiasm and seriousness will lead them to reach increasingly more satisfactory results.

We think that the way we have worked in conjunction with IFLA-PAC, supported by structures already in place (the Joint Committee and the Blue Shield), has yielded interesting results.

The fundamental problem in this area is sustaining leadership - organizing all parties involved to make sure that all instructives travel smoothly down the management hierarchy is difficult.

THE CHILEAN VERSION OF BLUE SHIELD

The Chilean Blue Shield Committee was instituted in February 2004 to create policies and conduct activities related to prevention and emergency preparedness plans, in order to respond to disasters striking heritage collections, museums, monuments, and others.

The committee is currently made up of nine persons representing the following institutions: DIBAM (the Directorate of Libraries, Archives and Museums in Chile), ICOM, institutions involved in its efforts, such as ONEMI, INP (Instituto nacional de Previsión) and ARPA (Red de Archivos Patrimoniales de Valparaiso). There is also a third level of national entities and individuals who have offered us their valuable support.

Representatives of each one of the aforementioned organizations meet once a month. Minutes are taken, tasks are delegated and news about the matter are shared. Together, the group establishes an annual action plan, as well as a strategic plan for between now and 2008.

The following are some of the things that the committee did in 2005.

- The organization and execution of the Heritage Project Network: Blue Shield International Seminar in Santiago in October 2005. It took place at the National Library, with 60 participants, in average. The presentations made were published on the web. Although the material is no longer available online, the presentations have been recorded on CDs, which we make available for distribution, in Spanish version.
- A structural study of the building that houses both the National Library and the National Archive, including its electrical system, its water piping, its sprinkler system and its other fire extinguishing resources. We have got a project approved to restore the building's central heating system in 2006, thereby eliminating the use of gas-powered heaters, and we are moving towards improving upon chemical flame retardant piping network.
- Periodic visits from the Heritage Brigade of the Chilean Fire Department, who came to learn more about the building. The Fire Department carried out a study on the building and is beginning to apply palliative measures there.
- We continued with the process of identifying valuable collections and re-locating them to more suitable and separately storage areas. Other collections, such as digital storage tapes, microfilm and others, are located in a separate building.
- Preparing for the tasks we are set to carry out in 2006, which are the following:
  – consolidating the committee in a variety of ways;
  – strengthening alliances, while expanding our sphere of influence;
  – delegating the following specific individual and joint tasks to each member of the committee: publicity, financing, communications, strategic planning, contact with authorities, training, and others;
  – increasing the distribution of material to our Directory of approximately 160 individuals and institutions at this point. Responses from these groups vary, but there is

a high level of support. Members come from heritage authorities, leaders and employees of those institutions, universities, interested individuals, curators, private collectors, and others. These people are from both Chile and from other countries in the region whose activities we coordinate as the IFLA-PAC regional headquarters;
– a complete photographic registry of the building;
– we signed an agreement with ONEMI, the National Emergency Office (www.onemi.cl), which is part of the Interior Ministry. It has regional offices throughout Chile.

The central objective of the ONEMI is to guide, coordinate, evaluate, consult on and assess the management of resources allocated for the prevention and management of emergencies and man-made and natural disasters, at the local, regional and international levels. Its mission is to help improve the quality of life of Chilean citizens by enhancing measures to protect the safety of people, their possessions and their surroundings.

One of the interesting aspects of our agreement with ONEMI is related to the regional and national reach of the institution. This will allow us to expand upon the work we have done with government support and personnel experienced in this area. Chile is a rather earthquake-prone country, and ONEMI is internationally recognized for its responses both to earthquakes and other types of emergencies.

Heritage preservation is among the objectives of ONEMI, but the organization has not yet developed upon this goal. So it is set to benefit from its agreement with us as well.

The agreement and its benefits for the Chilean Blue Shield are the following at least during the year 2006.

- A regular course on contingency planning:
  once one passes this course, he or she moves on to the second level – Vulnerability and Risk Detection – followed by a third level course on the design of institutional preparedness measures. However, in our experience, people and institutions have received sufficient training after the basic course to be able to establish their own policies in this field.
- There will be three regional workshops, in the north, middle and south of the country – after all, Chile is 4 200 km long. No more than 25 people can be in any one workshop, since they are highly participative and include field tests. They last for one week, eight hours a day. They cost US$144, including food and lodging; this is an extremely low price, because it is subsidized by the government.
- ONEMI has invited us to speak at its annual meeting in Santiago in April 2006, in order to educate its regional delegates on heritage preservation.
- ONEMI offered to give Blue Shield feedback and suggestions on the measures it is taking.
- One of the major advantages of this agreement is that it will focus on high-impact areas, with measurable results.

THE WORK OF IFLA-PAC AND BLUE SHIELD: A SYNTHESIS

- Constant partnership with IFLA-PAC in Paris
- Links with Argentina, Peru and Ecuador
- Publications and presentations
- Translations
- Conferences
- Training courses and workshops
- Cooperation with partner organisations, sending of materials, correspondences, invitations and field trips
- Sharing information from IFLA-PAC and Blue Shield with authorities, all national and regional organisations involved, universities, and individuals – both Chileans and foreigners
- Agreement with ONEMI
- Searching for leaders throughout the country

CONCLUSIONS

- There needs to be a paradigm shift around preventing and preparing for emergencies and disasters. Much remains to be done, and the work will only move forward if the people in charge of heritage preservation make a committed effort. Awareness of risk, emergency and disaster prevention measures need to be heightened.
- The authorities need to begin to think at the highest levels about the future of the heritage of our countries. Our cultural heritage is not going to preserve itself by magic.
- Preservation and conservation on digital media brings with it its own risks – its own versions of floods, earthquakes and fires occur in microchips and cyberspace.
- Trainings need to continue and be repeated because of employee turnover and people forgetting the correct procedures to follow.
- Patrons need to become more committed to heritage goods and services.

Merci beaucoup !

Thanks!

Catastrophes et conservation au Chili : l'éternel défi

Ximena Cruzat A.
Directeur, Bibliothèque nationale du Chili

Cette présentation fait état des activités de la Bibliothèque nationale du Chili en tant que centre régional IFLA-PAC. Le centre a été créé en 2003 et son champ d'action couvre également l'Argentine, le Pérou et l'Equateur. Nous évoquons en outre différentes actions relatives à la prévention des catastrophes et le Comité commun d'hygiène et de sécurité établi en 1995 à la Bibliothèque nationale, qui assure la sécurité des personnels et la prévention des catastrophes.

Le Comité chilien du Bouclier Bleu créé en 2004 est actuellement composé de neuf membres qui représentent la DIBAM*, l'ICOM*, l'ICOMOS* et l'ICA* ; il a également établi des liens avec d'autres pays et des institutions nationales périphériques comme l'ONEMI, Bureau national des mesures d'urgence, qui appartient au Ministère de l'Intérieur et comprend différentes antennes régionales au Chili.

Malgré divers problèmes auxquels nous sommes confrontés, nous devons mobiliser à court terme les professionnels chargés de la conservation du patrimoine (ressources numériques comprises) et les autorités, non seulement au Chili mais aussi au Pérou, en Argentine et en Equateur.

*** DIBAM : Direction des bibliothèques, archives et musées**
*** ICOM : Conseil international des musées**
*** ICOMOS : Conseil international des monuments et des sites**
*** ICA : Conseil international des archives**

Desastres y conservación en Chile: el eterno desafío

Ximena Cruzat A.
Directora, Biblioteca nacional de Chile

Esta presentación da cuenta de las actividades de la Biblioteca nacional de Chile en su carácter de Centro regional IFLA-PAC. El centro fue creado en 2003 y su campo de acción cubre también Argentina, Perú y Ecuador. Hacemos referencia además a diferentes acciones relativas a la prevención de desastres y al Comité común de higiene y seguridad establecido en 1995 en la Biblioteca nacional, el cual garantiza la seguridad del personal y la prevención de desastres.

El Comité Chileno del Escudo Azul, creado en 2004, está compuesto actualmente por nueve miembros que representan a la DIBAM, ICOM*, ICOMOS* e ICA*; ha establecido también relaciones con otros países e instituciones nacionales periféricas como la ONEMI, Oficina nacional de medidas de emergencia, adscrita al Ministerio del Interior y que abarca diferentes delegaciones regionales en Chile.*

A pesar de los diversos problemas a los que nos enfrentamos, debemos movilizar en el corto plazo a los profesionales encargados de la conservación del patrimonio (recursos digitales incluidos) y las autoridades, no solamente en Chile sino también en Perú, Argentina y Ecuador.

** DIBAM: Dirección de Bibliotecas, archivos y museos*
** ICOM: Consejo internacional de museos*
** ICOMOS: Consejo internacional de monumentos y sitios*
** ICA: Consejo internacional de archivos*

FORESEEING AND DEALING WITH THE UNFORESEEN – LIBRARY DISASTERS IN PERSPECTIVE

Per Cullhed, Senior Conservator, Director of Cultural Heritage Library Group,
Uppsala University Library, Sweden

The notice board of events in library history is lined with disasters, where we can distinguish a few major elements that have caused immense damage to society, now, as well as in history. Fire and water as a result of warfare, wilful destruction, censorship, religious conflict, construction failures, forces of nature, just to mention a few factors, all of those result in a collective memory loss. Sweden has suffered many library disasters, the most notable perhaps being the fire that destroyed the Royal Castle in 1697, when the National Archives and the Royal Library were severely damaged. As a result of the frequent city fires throughout history, whole societies were set back for years, which in turn forced authorities to implement rules on the safe construction of houses and cities. The city fire of Uppsala in 1702 destroyed large parts of the city, among which the library of Olof Rudbeck, Professor of Medicine and a notable botanist at the university. He is said to have saved the university library, which, miraculously, did not burn. His life work – a huge publication of flowers and plants – was destroyed by the fire when more than a thousand wooden print blocks ready for printing, disappeared in flames. Immediately after the fire and just a few months before he died, Rudbeck started to make a new city plan – taking into account that passive fire protection is one of the most important means of fire protection. His famous follower in the field of botany, Linnaeus, had a separate stone house built for his collection of plants, animal specimens, books and manuscripts. He called it his "Museum in altis", a name which indicates its position on a nearby hill. The reason for this location was to protect it from fire. As we soon shall see in some examples, still such compartmentation serves as a powerful means for the protection of libraries.

If we move a few centuries forward to the year 1973, we find a new library in the city of Linköping, 200 kilometres south of Stockholm. This library, which was a modern city library with an old book collection from the church, had been built with all the safety rules of the time. The old collections were protected mainly by compartmentation and the library was divided into three parts with the modern lending library in a large open hall at the entrance level, the old printed collections in the basement, and as an extra safety measure, the manuscript collection was separated from the printed books in yet another strong-room.

On the 20th of September 1996, the library was set on fire by right-wing extremists. The extremists' target was the information office dealing with immigration issues in the community. This office was situated in the library as an information-providing unit, in conjunction with the normal library book lending. Immigration being a controversial issue, the office had been threatened several times before. On the 3rd of September, personnel from the information office and library staff had a meeting and one of the decisions taken consisted inchanging the locks and eventually installing cameras for surveillance.

On Friday evening, on the 20th of September 1996, an open house session was held in the lecture hall of the library. This yearly occasion (dedicated to humanistic thought) was attended by some 400 persons and was interrupted at 11.08 p.m. by the fire alarm.

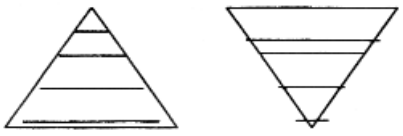
Library personnel discovered smoke and flames coming from a small room on the second floor (the same floor as the lecture hall), and attempted to extinguish the fire by using a hose from an inside fire post, however they did not manage to turn on the water. The room was situated 28 meters from the fire-post, the hose being 25 metres long, and therefore the communication between the persons at either end of the hose failed. By this time the stress level was already very high and after another fruitless attempt to use a hand held fire-extinguisher, they heard the fire brigade arriving. At this point they decided to rush back, to alert the people in the lecture hall and to guide the fire fighters to the place of the fire, leaving the door to the small room open.

Evacuation began at the same time as the fire brigade arrived at the library. They in turn had been alerted by the same fire alarm and arrived within three minutes after the alarm, that is 11.11 p.m. By this time the fire had spread from the small room over a wooden lattice framework in the ceiling. A fibre-board glued to the ceiling for acoustic reasons contributed largely to the spreading of the fire. As the wooden lattice framework burnt, the fibre boards also caught fire and started falling from the ceiling down into the library, acting like fire bombs spreading all over the library hall. Even the experienced firemen were stunned to see how quickly and violently the fire spread throughout the library. 16 minutes after the alarm all attempts to extinguish the fire were in vain and the smoke-divers were called out as smoke gases had accumulated to such an extent that signs of a smoke-gas explosion became evident. A roaring sound signalled the explosion; the whole library was now alight. The time for the explosion was somewhere between 11.24-11.30 p.m. At this point, the responsible fire-fighting officer, decided to stop extinguishing the fire in the library, instead, focus was directed to the surrounding houses. There were many reasons for doing this: a house for the elderly situated across a narrow alley from the library building, the houses being old and built mainly of wood and likely to catch fire. Moreover the fire-officer was informed of the older collections in the basement of the library building and this was another reason for concentrating the efforts to the surroundings. His responsibility is first to save lives and thereafter all material values. This does not mean extinguishing the fire at all costs. The main library building was already lost, and the fire could be confined to this building, then it was logical to stop extinguishing to save the values that were more likely to be damaged by the water than the fire, that is the books in the basement.

Due to the passive fire protection in the form of compartmentation, apart from soot-damage, the older collections were not affected by the fire, but the card catalogue housed in the main library building describing the 235 000 remaining books, was destroyed. There was no safety copy made so the remaining books were now un-catalogued.

In risk management, so called risk triangles are sometimes mentioned.

They consist of two triangles shown beside one another, one of them turned upside-down. The left triangle represents unfortunate coincidences, for example an electrical fault, which is



not uncommon and therefore is represented by the broad base. The right-hand triangle represents the damage caused by these faults - in the case of the single fault; damage is often small and is therefore represented by a small area. However, if we add the next segment of the left triangle we have two interacting unfortunate events, not so frequently occurring, but decidedly causing a greater damage as seen in the right triangle. If we have the unlikely coincidence of four or more interacting unfortunate events - a disaster is at hand, and damage is huge. This can be understood by the broad area at the top of the triangle to the right. The reason for showing this graphical interpretation of events and damages is purely pedagogical. It is obvious that if we can keep down the interacting unfortunate events to as few as possible, the ensuing damages will not be disastrous.

An interpretation of the Linköping fire shows that four events did interact. If we take into account the heat-activated alarm (not smoke activated), the inability of the personnel effectively use the emergency hose, their leaving the door to the small room open, and the acoustic plates glued to the ceiling, we have four interacting events resulting in a disaster.

Let us linger a moment here to point out that the last barrier to total destruction was the compartmentation, very traditional, and vitally important. If compromises had been made in the passive fire protection, total loss would have been the result of this fire.

For another example of the importance of passive protection of a library, we can turn to the library disaster of the Anna Amalia library in Weimar in Germany, which took place on September 3rd, 2004. This library, a UNESCO Memory of the World site, has a long history with its earliest building dating back to the 16th century. It is famous for the ambitions of its founder, the Duchess Anna Amalia (1739-1807) who wanted the library to be an open-lending library. This was uncommon for a private library in the 18th century. Its fame also rests on the fact that Johann Wolfgang von Goethe was librarian there from 1797 to his death in 1832. The library has been added to and re-built many times during its history, the last time just before the library caught fire in 2004. Underground stacks were already finished and an evacuation of the books for the sake of the rebuilding had already begun but, unfortunately, it was not completed when the library caught fire. During an earlier restoration in the mid 19th century, the court architect Coudray had added the left part of the building and in that process he built a rigid fire-wall. It is difficult to know to what extent this protective measure was influenced by experiences of fire in Coudray's days, but it remains a fact that the theatre in Weimar burnt down in 1825, an event that still was in fresh memory to the citizens, and without doubt also to Coudray. Although the fire was disastrous as more than 50 000 books were destroyed, the passive fire protection planned by Coudray and finished in 1849 stopped the spread of the fire in 2004. Other features in the building, such as the massive timber beams and the clay-filled flooring helped contain the fire within the room where it started.

These two fires serve as examples of how old-fashioned passive fire protection still plays a vital role in the protection of library collections. This is of course not surprising, but with the amount of new solutions in the field of active fire protection measures, such as automatic fire extinguishing protection, quick response time by the fire authorities, etc. It is possible that we may face pressures to cut down on passive fire protection. In such cases it may be valuable to remember these examples of libraries where everything else failed and the unimaginable became real – then the classic passive fire protection served as the last barricade against total destruction.

On January 8th, 2005, a hurricane swept over southern Sweden. This happens on rare occasions and the severity of these hurricanes can scarcely be compared to those in warmer regions. The wind speed was around or slightly below 40 metres per second, resulting in casualties both during the storm night and during recovery afterwards. The economic damage was

unprecedented in Sweden with heavy losses for forest-owners. Millions of trees fell during one night. During the storm-night, an archive in the city of Falkenberg was flooded, as the strong winds pressed the sea-water up to a hitherto unseen level, and a broken window was enough to allow an uncontrolled water-flow into the archive, that resulted in the damage of several hundred thousand archive boxes. Within a week, the archive was evacuated and all material to be retained was frozen pallet-wise in the city of Gothenburg, on the west coast of Sweden. Eventually it was all freeze dried, although some material still remains frozen, awaiting its normal terms of disposal. Working as a conservator and consultant on this remote site I made the following reflections. The main task for an external consultant is to answer questions as guidance for decisions to be made, for example to explain the need for quick evacuation and freezing to avoid mould, to suggest ways of packing etc. When it comes to details, a network of available specialists is essential and in this case, the best way of finding persons who could give advice proved to be my laptop, which could be connected to the Internet via a mobile phone. This became a more powerful tool than expected and it is to be recommended to anyone trying to give advice on a disaster site that still has a network for telecommunication intact. To put it in other words, dealing with the unforeseen was made much easier by being in constant contact with colleagues and having access to all the information resources available on the Internet.

On this occasion one of the questions to be answered, was the issue of how much time the rescuers have at their disposal before paper material begins to mould. After a quick search for the relevant telephone number on the laptop, a microbiologist was contacted and he supported the conclusion that due to low temperatures and mostly clean material, microbial activity would probably be slower than normal (+3-+7°C). Ever since Peter Waters published his manual on disaster response in 1975, 48 hours is the standard answer, a time-span, which, just as Peter Waters wrote in 1975, is highly dependent on temperature and ventilation. In fact, the week needed for the evacuation was sufficient for the safe handling of the paper itself. After a week, a foul smell developed at the evacuation site, possibly coming from the dirtiest material at the site, that is the pallets used for transporting the cardboard boxes containing the wet paper. An inspection carried out six weeks after the initial flooding showed wet, and partly wet, archival material, seemingly totally unaffected by mould! At this point, however, it was possible to identify groups of material more susceptible to mould than others. It was evident that the bound material, and the oldest, that is the already aged material, had begun to mould, whereas loose papers kept in boxes, remained largely unaffected. Without having made any microbiological analyses it was quite evident that it was the sized and glued or pasted material, that had developed mould, i.e. such material as is usually associated with library collections. As for the unaffected material it was surprising to find so little mould. One explanation, apart from the low temperatures, may be that the salt seawater could have acted as a retardant to the moulding process. On the other hand, the salts probably speeded up corrosion from paper clips, which in parts of the archive, resulted in heavy damage.

Unfortunately, disasters will continue to happen, I am still waiting to hear about a major loss of digital material because of a disaster. The process of sharing experiences and continually putting focus on disaster planning, so persistently manifested by the good work of IFLA-PAC, and Marie Thérèse Varlamoff, is essential for bringing down the rate of damage caused by these unfortunate events.

ANTICIPER ET GÉRER L'IMPRÉVU : UN REGARD SUR LES CATASTROPHESDANS LES BIBLIOTHÈQUES

Per Cullhed, Conservateur en chef, Directeur du Département chargé du patrimoine culturel, Bibliothèque universitaire d'Uppsala, Suède

Les principaux facteurs susceptibles de déclencher une catastrophe en bibliothèque sont peu nombreux. Il s'agit de l'eau et/ou du feu et des effets qu'il/elle produit sur les bâtiments et les collections. Néanmoins, les aspects extrêmement particuliers de chaque catastrophe font de la prévention un sujet complexe et ardu. Pour lutter contre le feu, on équipe généralement les bâtiments de bibliothèques de systèmes passifs de protection-incendie.

Cet article rendra compte de catastrophes survenues en Suède (Bibliothèque de Linköping, 1996) et à l'étranger (Bibliothèque Anna Amalia de Weimar, 2004) selon une perspective historique. Il analysera en particulier le rôle que joue, dans ces catastrophes, l'organisation des collections selon un mode compartimenté. En outre, cet article développera quelques notions fondamentales en termes de mesures d'urgence et terminera avec des observations récentes sur la prédisposition aux moisissures de différents types de papiers et de livres.

PREVENCIÓN Y GESTIÓN DE LO IMPREVISTO: UNA MIRADA A LOS DESASTRES EN LAS BIBLIOTECAS

Per Cullhed, Conservador Jefe, Director del Departamento encargado del patrimonio cultural, Biblioteca universitaria de Uppsala, Suecia

Los principales factores que pueden desencadenar un desastre en una biblioteca no son muy numerosos. Se trata del agua y/o del fuego y de los efectos que éstos producen en los edificios y las colecciones. Sin embargo, la prevención se convierte en un tema complejo y arduo debido a los aspectos extremadamente particulares de cada desastre. Para luchar contra el fuego, los edificios están equipados, generalmente, con sistemas pasivos de protección contra incendios.

Este artículo da cuenta de los desastres ocurridos en Suecia (Biblioteca de Linköping, 1996) y en el extranjero (Biblioteca Anna Amalia de Weimar, 2004) desde una perspectiva histórica. En este artículo se analiza, en particular, el papel que desempeña la organización clasificada de las colecciones en estos desastres. Por otra parte, se desarrollan algunos aspectos fundamentales en cuanto a medidas de emergencia y, finalmente, se hacen observaciones sobre la predisposición a la formación de moho de algunos tipos de papeles y libros.

From Disaster Plan to Action Plan

Sarah-Jane Jenner
Preservation Co-ordinator, British Library, UK

Introduction

Some disasters can be predicted and steps taken to prevent or reduce their likely impact, others may be unexpected and can have a profound and lasting effect. Incidents may range from large natural disasters such as earthquakes or seasonal flooding to small isolated incidents, such as a leaking pipe. Careful planning is essential when preparing for such disasters.

The key to successful planning and preparation is flexibility to have contingency procedures in place which can be adapted to varying situations, scales and outcomes. The British Library's contingency procedures are based on the fact that the organisation is large, unique and multi-sited and may be affected by any number of scenarios, both large and small.

The British Library is the national library of the United Kingdom, and receives a copy of every printed publication produced in the UK and Ireland. In 2003 government passed a new piece of legislation which extended the range of published works to include electronic material (e-legal deposit). This act formalised the voluntary code of electronic deposit which has been in place in the library since the year 2000 – and under which code (VDEP) the library has already received approximately 230,000 items. In addition to this national focus, the library holds major collections of rare and important material of varied provenance, and continues to add to its huge and broad-based resources by deposit, purchase and donation. The collection includes 150 million items in most known languages and three million new items are incorporated every year.

These collections are housed across six different sites, five in London and one large site in North Yorkshire. Due to the fact that there are over two hundred miles between the two locations, all London sites are treated as one for disaster preparedness purposes, while the North Yorkshire site is treated separately with its own set of procedures. This paper will focus on arrangements for the London sites only.

The British Library in London

The British Library has approximately 65% of its collections (occupying around 400 linear kilometres) and more than half of its 2500 staff based in four separate locations across the capital. These consist of the main flagship building at St. Pancras, the Newspaper Library at Colindale, North London and two satellite book stores.

The St. Pancras building is the largest public building constructed in the UK in the 20th century.

A total floor area of 112,000 square metres is spread over 14 floors – 9 above ground and 5 below. The majority of the collection items are housed in climate controlled basement storage areas.

The Newspaper Library at Colindale opened in 1905 and has been added to incrementally over time. It currently houses 52,000 separate newspaper, journal, and periodical titles.

In addition, there are two leased stores, one built in 1858, on the site of the Woolwich Arsenal as the Armstrong gun factory, the other built as a warehouse in 1965 and located in East London. These are both within one hour's drive from the main site, and a van service provides regular deliveries to the St. Pancras reading rooms.

DISASTER PLAN

The British Library's disaster preparedness measures are brought together in one document, the Major Incident Plan which was recently revised in light of last year's terrorist attacks in London.

Principal responsibility for the library's corporate disaster preparedness – for incidents affecting the staff or fabric of the buildings – lies with its Estates Directorate, the section of the library responsible for security, engineering and facilities management.

The library's plan involves a two stage approach to disaster preparedness. Stage one involves risk assessment and analysis to identify potential threats to the library and to take steps to prevent incidents occurring. Preventive steps can range from security measures to regular maintenance programmes of the building and plant.

Stage two is based around an Emergency Management System which aims to minimise risk - to people, the building, the collections, other assets or services - caused by hazards which cannot be predicted or avoided.

The Emergency Management System provides cover 24-hours a day, 365 days a year through a rota system which ensures that there is a duty officer, or Emergency Control Officer, available at all times to respond and take charge of any incidents.

Collection Care, the section of the library comprising the Preservation, Conservation, Collection Storage and Security Departments, has specific responsibility for incidents that may threaten or affect the collections. Salvage plans are in place to ensure that collections which are under threat can be immediately protected while damaged collection items can be salvaged and treated as soon as possible.

While an incident can be defined as "an occurrence or event that interrupts normal procedure or precipitates a crisis", a collection salvage incident is any situation that leads to the risk of damage or loss to the collections of the British Library.

In practice this could range from a dramatic increase in temperature within a storage area which could threaten collection items, which although is of concern to those caring for the collections may not affect the running of the entire library, to local flood damage caused by a leaking pipe or to a major fire which would have a much wider impact. For this reason the procedures that have been devised are broad and flexible and are applicable regardless of the incident type or the potential/actual impact.

Collection Salvage Procedures and Resources

1. Collection salvage rota

Collection salvage disaster preparedness measures are based around a rota system which complements the Emergency Management System and provides specific collection care provision 24 hours a day, 365 days of the year.

There are three levels of collection salvage personnel.

– Salvage Control Officers (SCO)

– Salvage Team Leaders (STL)

– Salvage Volunteers

The first two levels of personnel - Salvage Control Officers and Salvage Team Leaders - receive 24-hour paid allowance. The rota works with four people on-call over the two-week period, two as first-call and two as second-call, or back-up, in case of unforeseen problems. Salvage personnel must be available 24-hours per day for the entire two weeks and usually are on duty, on average, 3-4 times per year. This team is the frontline response to emergency calls and is supported by a pool of salvage volunteers.

2. Collection salvage personnel

Salvage Control Officers (SCO) will either be senior members of Collection Care staff or a senior curator. Their role is to manage the salvage response and liaise with the Emergency Control Officer and other third-parties, for example, Collection Heads or the Press Office, as required.

Salvage Team Leaders (STL) are all experienced conservators. Their role is to organise and manage salvage teams to protect threatened collections and to salvage damaged collections items.

Salvage Volunteers are members of staff who have agreed to be on a contingency list and be called upon to assist in the recovery operation of a large-scale emergency. They are not necessarily trained conservators and come from various departments throughout the library.

In the event of an incident that affects or threatens to affect the collection, the Emergency Control Officer will contact the Salvage Control Officer who will decide what kind of response is required and who needs to be contacted.

3. Collection salvage resources

- Mobile phones

All salvage rota personnel are issued with compatible mobile phones, which they are required to carry with them at all times when on-call. The phones have recently been upgraded to make use of modern mobile phone technology, and now include features such as cameras. This allows easy recording of the incident as it unfolds and picture messaging can be used to show colleagues not yet on site what has happened.

- Collection salvage organiser and collection salvage manual

All salvage rota personnel carry a collection salvage organiser, the size of a standard Filofax, which contains condensed details of salvage procedures, contact details and resources available. The collection salvage manual provides a more detailed guidance on responding to disasters, including details of equipment and other resources, conser-vation treatments and safe

methods of working. The organiser is designed to provide enough information to direct salvage personnel to each site and initiate the salvage process, while the salvage manual aims to provide more in-depth advice.

4. Salvage supplies

- Salvage trucks

Salvage supplies are available on all sites. Each library site has its own collection salvage truck. This is a large locked mobile trolley which contains protective equipment, spare copies of collection salvage organisers and salvage manuals, pads, pens, torches, small toolsets, disposable cameras etc.

- Salvage trolleys

Salvage trolleys complement the salvage trucks and several are located in different places at each site. The trolleys contain practical salvage equipment for immediate use, such as sorbent booms, fold-up crates, plastic bags, blotting paper etc. Equipment to make wind tunnels is also available; in addition at St. Pancras the main salvage store contains de-humidifiers, aqua-vacs, crates and plastic bags. The library has its own commercial blast and chiller freezers and a vacuum freeze-dryer at St. Pancras. There are also formal contracts with commercial salvage companies, especially in mass treatments, in case of large scale incidents.

5. Training

Great emphasis is placed on training as a way of underpinning the salvage procedures and providing support to collection salvage rota members. Responsibility for managing a disaster response operation can be stressful and frequent training is designed to ensure that people feel prepared and confident. Regular collection salvage training events are run, including yearly exercises which rotate between sites so staff have familiarity with all the library's London locations.

Shorter practical sessions focus on activities such as setting up wind tunnels, using equipment and handling wet books. There are regular tours of collection storage areas which are led by specialist curators from each department who are able to highlight priorities within their collection and material that is vulnerable or awkward - such as outsize or heavy items. An annual joint exercise is also organised between staff from Estates and the London Fire Brigade.

These sessions have helped familiarise people to each other and foster a good team spirit as evidenced during an isolated incident at the library in October 2005 when the collection salvage procedures were successfully put into practice.

CATASTROPHES : DU PLAN D'URGENCE À L'EXPÉRIENCE VÉCUE

Sarah-Jane Jenner, Coordinatrice conservation, British Library, Royaume-Uni

Dans cet exposé, on reviendra d'un point de vue pratique sur les grands axes de l'opération de sauvetage des collections et de prévention des catastrophes développée à la British Library au cours des dix dernières années. La British Library s'étend sur deux principaux sites, Londres et le Yorkshire, mais on choisira de se concentrer sur les mesures qui ont été prises à Londres pour limiter les dégâts que pourraient provoquer sur les collections des incidents imprévus.

La British Library a mis en place pour le sauvetage des collections un système de rotation qui fonctionne 24 heures sur 24, 365 jours par an et complète le roulement des équipes d'urgence établi par le Département des moyens généraux. Le système comprend deux catégories de personnels : les responsables chargés de contrôler le sauvetage (personnels expérimentés spécialistes de la conservation des collections ou équipes de conservateurs) et chefs des équipes de sauvetage (restaurateurs). On peut également compter sur les volontaires prêts, au besoin, à apporter leur aide. Même si le travail est volontaire, les personnels reçoivent une indemnité pour leur implication dans le système de rotation.

Des séances régulières de formation sont organisées pour l'équipe. Elles consistent à faire des visites du site, à repérer les documents à risques dans des collections spécifiques mais aussi à faire des exercices de mise en situation, des exercices pratiques et des repérages permettant de bien connaître les voies d'accès et le matériel. Cette organisation a permis à l'équipe de bien fonctionner et elle a porté ses fruits lors d'un incident récent. On entretient des relations avec d'autres départements de la bibliothèque pour assurer une continuité. La bibliothèque travaille également avec la Brigade des pompiers, ce qui a été utile lorsque nous avons abordé les questions pratiques de sauvetage. Les partenariats avec des institutions jumelles, les possibilités de formation et les contributions réciproques sont également des sujets à l'étude.

DESASTRES: DEL PLAN DE EMERGENCIA A LA EXPERIENCIA

Sarah-Jane Jenner, Coordinadora de conservación, Biblioteca británica, Reino Unido

En este trabajo, volveremos al punto de vista práctico de los grandes ejes de la operación de salvamento de colecciones y la prevención de desastres desarrolladas en la Biblioteca británica en los últimos diez años. La Biblioteca británica está ubicada en dos sedes principales, Londres y Yorshire, pero decidimos concentrarnos en las medidas que se han tomado en Londres para limitar los daños que podrían ocasionar a las colecciones los incidentes imprevistos.

La Biblioteca británica ha implantado un sistema de turnos para el salvamento de las colecciones que funciona las 24 horas, los 365 días del año, y complementa los turnos del personal de emergencia establecidos por el Departamento de servicios generales. El sistema comprende dos categorías de personal: los responsables encargados de controlar el salvamento (personal experimentado especialista en conservación de colecciones o equipos de conservadores) y jefes de equipos de salvamento (restauradores). Igualmente, se puede contar con los voluntarios dispuestos a prestar ayuda, según se requiera. Incluso si el trabajo es voluntario, el personal recibe una indemnización por su participación en el sistema de turnos.

Se organizan sesiones regulares de capacitación para los miembros del equipo. Estas sesiones consisten en hacer visitas al sitio, localizar los documentos que corren riesgo dentro de colecciones específicas, además de conocer las vías de acceso y el material. Esta organización ha permitido al equipo funcionar bien y dio sus frutos durante un incidente reciente. Mantenemos relaciones con otros departamentos de la biblioteca para garantizar que haya continuidad. La biblioteca trabaja también con el Cuerpo de bomberos, lo cual ha resultado útil para abordar los problemas prácticos del salvamento. Las asociaciones con instituciones similares, las posibilidades de capacitación y las contribuciones recíprocas son igualmente objetos de estudio.

LE PLAN D'URGENCE DE LA BIBLIOTHÈQUE NATIONALE DE FRANCE

Josiane Laurent,
Coordinatrice du plan d'urgence
de la Bibliothèque nationale de France

INTRODUCTION

Rappelons que le plan d'urgence de la Bibliothèque nationale de France a été mis en place en 2000. En ce qui me concerne, j'ai été chargée de la coordination du plan d'urgence en juillet 2004. Comme chacun sait, un plan d'urgence est adapté à chaque établissement suivant la situation, la structure, la vétusté des bâtiments. La Bibliothèque nationale de France, pour sa part, est implantée sur différents sites : François-Mitterrand, Richelieu, Arsenal, Bussy-Saint-Georges, Sablé-sur-Sarthe, Avignon, tous avec des spécificités variées. Ce qui est applicable à un site ne le sera pas obligatoirement pour un autre.

Un dialogue continuel s'est établi avec la Direction des collections, les responsables des bâtiments, les pompiers, la sûreté, les ateliers de restauration.

SINISTRE

Je parlerai ici plus particulièrement du dégât des eaux survenu à la Bibliothèque nationale de France en avril 2004, tôt le matin en semaine. Pour mémoire, je rappelle que ce sinistre a été provoqué par une rupture de vanne commandant les sprinkleurs ; l'eau s'est répandue sur les collections conservées dans les magasins du 11e au 9e étage de la Tour 1. Les ascenseurs ont cessé de fonctionner mais fort heureusement, l'électricité n'a pas été coupée ce qui a permis l'accès plus facile dans les magasins.

C'est donc à partir de cette expérience que j'ai pu étudier ce qui a bien fonctionné et ce qui a moins bien marché. De toute évidence, les équipes de sauvetage ne semblaient pas préparées et un manque d'organisation a pu être constaté. Certes, beaucoup de volontaires sont venus de tous les départements de collections mais il manquait une personne ressource capable de les conseiller quant à l'ordre des tâches à exécuter. En définitive, tout semblait partir dans tous les sens ; la difficulté d'acheminement du matériel et des caisses (11 à 13 étages à gravir ou à descendre par les escaliers) a retardé le processus d'évacuation des ouvrages sinistrés vers les ateliers du département de la Conservation où se situaient les espaces sains de traitement.

C'est donc en étudiant tout ce cheminement que j'ai procédé par étapes afin de bien cadrer le déroulement des opérations et déterminer qui fait quoi lorsqu'un sinistre survient. L'urgence était donc de former des équipes et de bien les structurer an amont. Chaque équipe comportera cinq à six personnes et sera dirigée par un chef d'équipe. Les chefs d'équipe eux-mêmes suivront les indications données par l'encadrant qui, en général, est le responsable conservation ou le responsable des collections du département concerné ; il est, par ailleurs, conseillé que ce responsable ait un suppléant. Pour cela, il fallait passer par des formations.

FORMATIONS

Certes, ces formations existaient mais n'étaient pas suffisamment nombreuses ; nous sommes donc passés en 2005 de cinq à dix sessions par an avec un maximum de 20 personnes par session pour le stage de sensibilisation au plan d'urgence. Pour l'année 2005, 103 agents ont été formés en interne et 40 issus de structures externes. Nous accueillons effectivement des participants extérieurs. A la demande du Programme PAC (Préservation et Conservation) de l'IFLA, la Bibliothèque nationale de France a décidé d'ouvrir ses formations, dans le cadre du Bouclier Bleu, aux collègues d'institutions extérieures. Nous avons par ailleurs étendu cette formation aux pôles associés. Chaque session dure une journée et comporte une partie théorique : comment mettre en place un plan d'urgence et pourquoi, les outils de prévention, que faire en cas de sinistre, les différents cas de figure, les risques et comment gérer l'après sinistre. Vient ensuite la partie pratique : démonstration des pompiers et leur rôle lors d'un sinistre, manutention des caisses, apprentissage des bons gestes, disposition des ouvrages mouillés dans les caisses, séchage des volumes, connaissance du matériel et des fournitures de premier secours.

Le personnel ainsi formé est ensuite demandeur de nouvelles connaissances. C'est la raison pour laquelle, nous avons mis en place depuis janvier 2006, une formation s'adressant aux personnes susceptibles de devenir chefs d'équipe. Cette formation s'appuie principalement sur la gestion d'une équipe en situation de crise. Une autre formation pour les encadrants est à l'étude.

Rappelons brièvement les tâches essentielles à assurer en cas de sinistre sans précipitation mais dans l'urgence :

- balisage du cheminement d'évacuation ;
- apport du matériel et des fournitures de premier secours ;
- déménagement des documents depuis les magasins ;
- mise en caisse en respectant les différentes filières (documents secs, humides, mouillés) ;
- transport des caisses ;
- établissement de listes des ouvrages sinistrés ;
- organisation du séchage ;
- préparation des espaces de traitement ;
- surveillance des documents en cours de séchage.

Il est bien entendu que le rôle et les tâches des équipes des départements de collections diffèrent de ceux des équipes des ateliers du département de la Conservation. Une fiche de poste a, du reste, été établie afin de mieux cerner les actions de chacun.

Ces formations servent à établir des listes du personnel formé afin de constituer les équipes. Ces listes doivent être tenues à jour continuellement compte tenu des mouvements de personnel (une ou deux fois par an au minimum).

Il est important également de réactualiser régulièrement les listes de fournisseurs et de prestataires auxquels on peut avoir recours en cas de sinistre et d'établir des pré-conventions. Des démarches sont entreprises à cet effet et pour certaines entreprises comme celles qui pratiquent la lyophilisation, nous étudions des protocoles de traitement avec l'aide de nos laboratoires.

Par ailleurs, d'autres stages qui se sont déroulés à la Bibliothèque nationale de France ont permis un impact très satisfaisant pour le plan d'urgence, notamment le stage sur la conservation où nous avons accueilli 21 personnes en interne et 16 en externe aux mois de juin et octobre 2005, ainsi que le stage destiné à COSADOCA, Consortium de bibliothèques suisses, avec 14 participants.

D'autres établissements sont demandeurs de formations sur le plan d'urgence et dans ce cadre, je suis intervenue auprès de l'OCDE (Organisation de coopération et de développement économiques), de l'Association des archivistes français, de l'ENSSIB (Ecole nationale supérieure des sciences de l'information et des bibliothèques), à l'appui de diaporamas et de supports de cours que j'ai, moi-même, élaborés.

La Journée du Patrimoine du 18 septembre 2005 a contribué, pour sa part, à faire connaître ce qu'était le plan d'urgence de la Bibliothèque nationale de France.

LOCAUX DE STOCKAGE DU MATÉRIEL ET DES FOURNITURES

Sur le site François-Mitterrand, nous avons vingt locaux où sont stockés le matériel et les fournitures pouvant servir aux premiers secours (caisses, buvards, papier absorbant, serpillières, seaux, boudins absorbants, éponges, chiffons, sacs poubelles, masques, tabliers, lampes…). Il est important d'en vérifier le contenu périodiquement. De même, il faut vérifier les dates de péremption de certains matériels, contrôler leur bon état de fonctionnement et assurer le réapprovisionnement afin de ne manquer de rien en cas de sinistre. Le gros problème est que ces locaux doivent être accessibles à tous en cas de sinistre mais doivent être clos. Des personnes malveillantes pensent qu'il suffit de puiser dans ces stocks pour leurs besoins personnels. Une information doit se poursuivre pour bien faire comprendre l'utilité et le but de ces locaux. Nous étudions actuellement un procédé de sécurisation de ces locaux afin d'éviter les disparitions de matériels, un peu trop fréquentes ces derniers temps.

LA BNF DEVIENT UNE RÉFÉRENCE EN MATIÈRE DE PLAN D'URGENCE

Les bibliothèques et les services d'archives sont de plus en plus sensibilisés à la protection de leur patrimoine culturel et font appel à nous pour des conseils ou des expertises tant sur les procédures pour la mise en place d'un plan d'urgence que pour des adresses de prestataires. Mais ces structures nous consultent également pour des questions d'ordre technique telles que les procédures d'évacuation de documents sinistrés, des dépoussiérages de collections dans le cadre d'un incendie (suie), des méthodes de séchage d'ouvrages.

Ces derniers mois, plusieurs bibliothèques sinistrées soit par le feu, soit par un dégât des eaux, ont fait appel aux experts du département de la Conservation. J'ai donc été amenée à faire des constats auprès de ces bibliothèques, donner des conseils, rédiger des rapports et assurer le suivi des collections sinistrées. Très récemment, je me suis rendue dans les banlieues où des manifestations ont eu lieu et où des bibliothèques ont été incendiées, ainsi qu'à la Bibliothèque du Sénat qui a subi un dégât des eaux. Certains cas sont encore d'actualité. Ces sinistres extérieurs nous permettent d'enrichir notre expérience, de tirer des leçons et ainsi d'améliorer notre plan d'urgence et nos connaissances en la matière. Il est essentiel par ailleurs, d'établir un partenariat avec d'autres institutions culturelles de proximité dans le cas d'un sinistre de grande envergure qui pourrait se produire dans notre établissement, et que l'on soit obligé d'évacuer nos documents à l'extérieur.

En qualité de coordinatrice du plan d'urgence de la Bibliothèque nationale de France, j'ai été amenée à participer aux activités du « Bouclier Bleu » (association pour la défense du patrimoine culturel en cas de conflit armé ou de catastrophe naturelle). Je fais, à présent, partie du Conseil d'administration et œuvre au sein de trois groupes de travail.

2006 sera l'année où le plan d'urgence sera pleinement opérationnel.

Preventing Disasters at the National Library of France (BnF)

Josiane Laurent, Coordinator of the BnF Disaster Plan

After long discussions, a disaster plan has been implemented at the National Library of France in 2000. Today, it is one of our significant activities.

On April 2004, some collections were water-damaged which was a necessary evil as we learnt from our misfortune to improve the organisation of emergency procedures.

Many professionals attend the training sessions organised at the BnF to raise awareness about disaster preparedness. Learning is provided about emergency measures to take for the salvage of collections in case of disaster. Training sessions about disaster preparedness are also provided in other institutions collecting the cultural heritage.

It is absolutely necessary to implement some facilities provided with first-aid supplies, to control them regularly and keep them secure.

The National Library of France tends to become an example in terms of disaster preparedness: different kinds of libraries or archives often ask us for advice or addresses of suppliers.

We also propose our expertise in some libraries that have been affected by a disaster. We have joined the French Committee of the Blue Shield to take part in the protection of the French cultural heritage and we have initiated a fruitful collaboration with other French cultural institutions.

Plan de emergencia de la Biblioteca nacional de Francia

Josiane Laurent,
Coordinadora del plan de emergencia de la Biblioteca nacional de Francia

El plan de emergencia de la Biblioteca nacional de Francia, establecido en el año 2000 a través de diálogos continuos, ocupa un lugar importante en el seno de nuestra institución.

No hay mal que por bien no venga: el siniestro de los daños causados por el agua en abril de 2004 permitió aprender una lección y ha servido para mejorar los procedimientos de la organización.

Los cursos de capacitación para crear conciencia acerca del plan de emergencia organizados en la Biblioteca nacional de Francia presentan una ventaja indiscutible, demuestran un impacto importante en cuanto a la forma de actuar para salvar las colecciones en caso de un siniestro y contribuyen a una proyección esencial hacia el exterior. Los cursos de formación en el plan de emergencia dictados en los establecimientos que albergan un patrimonio ultural, por su parte, han permitido indicar cuáles deben ser los métodos para la aplicación de los planes de emergencia.

La instalación de locales dotados de materiales y de equipos de primeros auxilios es necesaria al igual que su control regular y su aseguramiento.

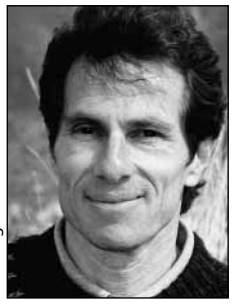
La Biblioteca nacional de Francia se ha convertido en un ejemplo en materia de planes de emergencia por ello, diversas bibliotecas o servicios de archivos nos contactan con frecuencia para obtener asesoría, direcciones de contratistas y proveedores, por ejemplo.

El papel de experto que representamos es muy solicitado por las bibliotecas siniestradas.

Nuestro carácter de miembro del Escudo Azul contribuye a participar en la protección del patrimonio cultural francés y da lugar a intercambios fructíferos con otros establecimientos culturales.

Towards a National Disaster Response Protocol

Randy Silverman,
Preservation Librarian, University of Utah, USA



Introduction

Since the Florence flood of 4 November 1966, organized disaster response for cultural property has been a focus for conservators. A decade later, in 1976, Mr. Stephen Salmon noted a "glaring… lack of preparedness for disaster[s] by almost all American libraries" at the Library of Congress planning conference to initiate a national preservation program.[1] Little has changed today 40 years after that flood in terms of establishing a nationally coordinated plan. It is now clearly recognized that only one in five cultural institutions has created an emergency response plan that encompasses collections,[2] and that some or all of these plans may prove ineffectual in the case of a regional disaster. A national disaster response protocol is urgently needed to ensure the survival of cultural property regardless of the size of the event. This protocol must be able to be activated quickly to deliver appropriate assistance to affected institutions, and so, must be free from the normal bureaucracy of cultural institutions that results in delays that will increase collection damage. This article describes two large institutional catastrophes and one recent regional disaster in an effort to underscore the importance of creating a nonprofit entity – the **N**ational **D**isaster **C**enter for Cultural Property (NDC) – capable of implementing an effective response in situations where local resources and expertise are overwhelmed and cultural property is at risk.

Two Institutional Disasters

On Friday, 8 June 2001, flood waters from Tropical Storm Allison filled the lower level of the University of Houston's O'Quinn Law Library. The water rose to a height of eight feet, immersing the collection for about two days. Counted among the damage, according to Librarian Professor Jon Schultz, were approximately 200,000 books, 1,200,000 microfiche; "one of the finest Mexican law collections in the country;" the "absolutely superb" John Brown Admiralty collection; paper copies of the Records and Briefs of the Texas Supreme Court; and the John R. Brown Archive (John R. Brown was the Chief Judge for the Fifth

1. Stephen R. Salmon was then Executive Director for Systemwide Library Planning at the University of California, Berkeley. His comments were the result of personal experiences with Hurricane Celia that hit Corpus Christi, Texas in 1970 while he worked in the area. See: *Proceedings of the planning conference for a national preservation program held at the Library of Congress in Washington, D.C. on December 16 & 17, 1976* (Washington, D.C.: Office of the Assistant Director for Preservation, Administrative Department, Library of Congress, 1977): 85.

2. Heritage Preservation and the Institute of Museum and Library Services, *A public trust at risk: the heritage health index report on the state of America's collections* (Washington, D.C.: Heritage Preservation, 2005): 6-7.

Circuit Court from 1967 until 1979, historically significant as the principal legal architect of desegregation throughout the south).[3] Damage to the Houston Law Library's collection was estimated at US$ 28,499,796 independent of building issues.

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First view inside Colorado State University's Morgan Library, the stacks collapsed by advancing flood waters.

From the first Professor Schultz considered most of the Law Library's collection unrecoverable. In a short video shot on-site two days following the flooding, Professor Schultz documents floating books and furniture in the main stairwell leading to the ground floor where a large portion of the collection was housed, and sadly comments, "What can we get out? What can we save? Probably very little if anything".[4] A consultant was retained to direct the recovery effort.[5] The library's ground and first floors were separated using 6.3 mil (0.16 mm) black plastic sheeting (Visqween) and the environment in the upper part of the building was stabilized using two sixty-ton portable air conditioners to reduce the risk of mold germination in the dry part of the collection. Standing water was pumped out and the library's unique archival material salvaged and vacuum freeze dried.[6]

As for the majority of the submerged collection, 175,000 books and 1,200,000 microfiche were summarily discarded in the ten days following the flooding. Professor Schultz's documentary film captured "the Law Library [collection] leaving one bucket at a time," as front-end loaders, their steel buckets laden with books, transferred the collection to industrial-sized garbage dumpsters that were unceremoniously transported to a Houston landfill.[7]

Two years after the tribulation caused by Tropical Storm Allison, the Federal Emergency Management Agency (FEMA) paid the University of Houston three-fourths of the collection's value – US$ 21.4 million – to compensate for the loss. The balance of the collection's value was made up from private sources.[8] A sad scenario. Even with cash in hand, Professor Schultz estimated 50 years of staff time would be required to re-amass the Law Center's collection,[9] a task the library delegated to AMIGOS Library Services, a nonprofit resource-sharing network serving the southwestern United States.

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3. SCHULTZ, Jon, *The Albertus Project: Surviving Allison*, video recording, 17:21 min. (University of Houston, c. 2002).

4. *Ibid*, Sunday, 10 June 2001.

5. HARTSELL, Don, Principal, Solex Environmental Systems, 100 Wirt Road, PO Box 550045, Houston, TX 77056; tel. 800-848-0484, or 713-963-8600; Fax (713) 461-5877; <drh@solexrobotics.com>; <http://www.solexrobotics.com>.

6. LIENHARD, John H., "Engines of Our Ingenuity, No. 1655: Après le déluge," retrieved 28 January 2006, <http://www.uh.edu/engines/epi1655.htm>

7. SCHULTZ, Jon, *The Albertus Project*, Tuesday 26 June 2001.

8. The total loss was US$ 38 million. Replacement costs for microfiche was US$ 0.60 each (US$ 2 million total). The cost paid for the books was US$ 215 per volume. This breaks down as US$ 100 each for half of the volumes (87,500), and US$ 150 each for the other half, plus US$ 90 per volume for processing, locating, finding, offsite housing. These figures were kindly provided by Professor Jon S. Schultz, Librarian, University of Houston O'Quinn Law Library, email correspondence 19 July 2004.

9. SCHULTZ, Jon S., "Planning and Recovery Process: Easing the Pain," in *Maximize Today and Envision Tomorrow, Educational Program Handout Materials, Sunday, July 13 & Monday, July 14, American Association of Law Libraries 96th Annual Meeting and Conference, July 12-16, 2003, Seattle, Washington,* (Chicago: American Association of Law Libraries, 2003): 112.

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To reduce mold growth, wet books were blast chilled on-site with liquid nitrogen before being transported to a commercial freezer plant in Wyoming, one hour north.

By way of comparison, four years earlier, Colorado State University's (CSU) Morgan Library in Fort Collins, Colorado suffered a flood caused by days of rain that saturated the arid hills surrounding the city. On 28 July 1997, the ground floor of the library filled with nine feet of water submerging for 24 hours a collection of approximately 425,000 twentieth-century science books and bound journals.

CSU also sought help from a commercial consultant who hired a disaster recovery firm to coordinate the recovery.[10] After pumping the water from the ground floor, the books were removed from the library using cardboard boxes lined with black plastic garbage bags, stacked onto wooden pallets, and subsequently packed into the trailers of commercial refrigerated freezer trucks. The collection was then cooled onsite using liquid nitrogen to reduce the rate of mold growth en route to a commercial freezer facility in Laramie, Wyoming. The books remained frozen until they could be shipped for treatment to Disaster Recovery Services (now Belfor USA) in Ft. Worth, Texas. Disaster Recovery Services washed each book individually to remove debris, squeezed it to remove excess water, and re-froze it in preparation for vacuum freeze drying in commercial chambers. Mold, which began developing on the third day of a 14-day packout, was sterilized using gamma radiation in a commercial sterilization facility in Ft. Worth. Each book was then wiped down and shipped back to CSU in Ft. Collins. The cost for this treatment regimen, including transportation, was approximately US$ 9.00 per volume (US$ 3,825,000).

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Ann Seibert (Library of Congress) and Larry Wood (Disaster Recovery Services, now Belfor) washing thawed books to remove residual dirt before re-freezing in preparation for vacuum freeze drying.

Back at CSU, torn pages were repaired, mold-damaged leaves replaced with photocopies, and damaged bindings commercially rebound at a library bindery. The total cost to the Library to return the entire water-damaged collection to active service, including in-house processing, photocopying, mending, and commercial rebinding was approximately US$ 30.00 per book (US$ 12,750,000). The entire process took approximately two years to complete.[11]

From these figures, it can be seen that the per volume cost was approximately seven times less to recover the books at CSU than at the University of Houston (US$ 30.00 X 7.16 = US$ 215.00), while the average difference in price between a new science and law book is only approximately US$ 17.50 per volume.[12] Occurring within four years of each other, these two incidents demonstrate that standards for the recovery of flood damaged books are not well established, and by extension, that these two recovery protocols produced significantly different outcomes.

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10. Bill Boss directed CSU's campus-wide recovery; the present author was hired as a consultant to Boss to define recovery protocols for the library's water damaged books.

11. SILVERMAN, Randy, "The Day the University Changed," Idaho Librarian 55, no. 3 (February 2004), <http://www.idaholibraries.org/newidaholibrarian/200402/index.htm>

12. For 2005, book supplier Blackwell North America calculated the average cost of science books they supplied at US$ 95.49 (data retrieved 10 February 2006 at: http://www.blackwell.com/pdf/CC0405.pdf) while, according to Lee Warthen (Assistant Director, University of Utah Quinney Law Library), the average cost of law books for 2004-05 was US$ 112.99, a difference of US$ 17.50 per volume.

HURRICANE KATRINA: A REGIONAL DISASTER

Packing 140 MPH winds, Hurricane Katrina made landfall in Plaquemines Parish in Southern Louisiana at dawn 29 August 2005 as a strong Category 4 hurricane. By mid-morning, the hurricane was downgraded to a Category 3 storm as it touched land again near the Louisiana-Mississippi border, then sustaining 125 MPH winds. According to local reports, the storm surge, forced ashore over Mississippi's shallow continental shelf, exceeded 25 feet in some places. The hurricane headed northeasterly through Mississippi, with wind speeds decreasing to 100 MPH by the time it reached the small town of Laurel, one hundred miles north of the Gulf of Mexico. Even now, five months after the storm, Katrina's devastation in many of the affected areas of Mississippi remains largely unreported, overshadowed by the disproportionate media coverage of New Orleans. For example, the estimated US$ 125 billion in damage for the region includes 65,380 homes destroyed in Mississippi, while less than ten percent of that figure – 6,000 homes – were demolished in New Orleans and neighboring St. Bernard Parish.[13]

In preliminary reports, the U.S. National Oceanographic and Atmospheric Administration (NOAA) labeled Katrina "the most costly natural disaster to strike the United States ever".[14] Despite the urgency of the situation, no US infrastructure was in place in Katrina's aftermath to provide disaster recovery assistance to cultural institutions in crisis. FEMA's immediate focus was to protect human life, after which architectural and archaeological sites were prioritized; movable cultural heritage was not addressed for months. On the ground, agencies, such as the Mississippi Department of Archives and History, took the incentive to reach out to collecting institutions within their region to assess the damage. These efforts were limited by staff shortages as well as the need for these agencies to focus on their own damaged facilities and collections. Independently, a team of two conservators (Ann Frelson from Emory University and Christine Wiseman from the Georgia State Archives) begin assessing collection damage in Mississippi and Alabama, 14-16 September 2005. Another independent assessment team comprised of Debbie Hess Norris (Heritage Preservation), Richard Pearce-Moses (Society of American Archivists), and David Carmichael (Council of State Archivists) arrived in Mississippi a couple of days later and focused on the region's most historically significant collections including Beauvoir, Jefferson Davis' Home and Presidential Library.

© AASLH Mississippi Team#1

Hurricane Katrina's storm surge along the Gulf of Mexico destroyed numerous buildings outright or washed away the first floor, including this church.

Due to communication outages and a total loss of infrastructure, responders had little factual information to go on. As a first step toward broadly assessing the condition of all the affected collections, the **A**merican **A**ssociation for **S**tate and **L**ocal **H**istory (AASLH) and the **A**merican **I**nstitute for **C**onservation (AIC) initiated a plan to put two mobile units of conservators on the ground in the Gulf Coast region of Louisiana and Mississippi. This program was generously supported by the Watson-Brown Foundation of Thomson, GA and

13. KUNZELMAN, Michael (Associated Press), "Mississippi fears Hurricane Katrina's toll on state will be forgotten," *Contra Costa Times* Jan. 23, 2006, retrieved 28 January 2006, <http://www.contracostatimes.com/mld/cctimes/news/13690292.htm>

14. GRAUMANN, Axel et. al., "Hurricane Katrina, a climatological perspective: preliminary report," National Oceanographic and Atmospheric Administration National Climatic Data Center, Technical Report 2005-01, October 2005, <http://lwf.ncdc.noaa.gov/oa/reports/tech-report-200501z.pdf> (7 November 2005).

© AASLH Mississippi Team#1

Beauvoir, Jefferson Davis' Home (1848-1851), constructed on raised piles and situated 500 feet from the Gulf of Mexico, has weathered 22 previous hurricanes. The building suffered roof damage and lost most of its wrap-around porch.

The History Channel television network. Each team was led by a museum professional and staffed with conservators selected by AIC. Four one-week rotations were planned for each state. The project was overseen by Steve Shulman, the Project Director hired by AASLH to coordinate Hurricane Katrina recovery. The teams were dubbed **H**eritage **E**mergency **A**ssistance **R**ecovery **T**eams – HEART.

This author was a member of the first Mississippi HEART assessment team that included Joy Barnett (Administrative Assistant, Texas Association of Museums), her son Ashley Barnett (Fire and Rescue, Burnet, TX), and Gary Frost (Library Conservator, University of Iowa). Arriving in Jackson, Mississippi, 22 September 2005,three and a half weeks after the storm, we ate and slept in a rented recreational vehicle (RV) and used a rental car to increase mobility.

Passing through numerous National Guard checkpoints set up to prevent looting, the team visited 12 institutions and looked for, but couldn't locate a thirteenth. Some institutions (notably, those located one hundred miles inland) experienced moderate water damage to the collection, while others, situated within the storm surge, experienced everything from severe flooding to complete destruction of the institution's building. In addition to noting the condition of each of these collections and their facilities, our role became advisory, helping staff determine the most effective means of drying collections in the unseasonably hot and humid conditions (85F°- 85%RH) and with little or no electricity. Simply opening collections up to increase cross ventilation and spreading out wet materials to dry by evaporation was complicated by the difficulty of removing temporary plywood storm shutters screwed in place over windows. These shutters had been left closed in anticipation of subsequent storms,[15] or worse, due to the curator's fear of looting.

15. In fact, a second devastating storm, Hurricane Rita, made landfall near Sabine Pass, Texas, two days after the Mississippi HEART Team #1 arrived in Jackson, MS.

© AASLH Mississippi Team#1

Gulfport-Harrison County Public Library, the ground floor washed out by Hurricane Katrina's storm surge.

Four of the institutions visited qualified for **N**ational **E**ndowment for the **H**umanities (NEH) emergency assistance grants. The team helped staff members draft and submit applications to support collection stabilization efforts, and all four were successful, each receiving US$ 30,000.(16)

NEED FOR A NATIONAL SAFETY NET FOR COLLECTIONS

With the local population in crisis due to the loss of homes, belongings, employment, and in some cases the lives of friends or relatives, Katrina's aftermath underscored the need for a robust emergency response plan to help victims recover cultural property. To begin with, the HEART team arrived onsite nearly four weeks following the storm, a delay that could be reduced to minimize mold growth. For example, in the Florence flood hundreds of students (nicknamed "mud angels" or the Uffizi's "bathing attendants") arrived in two days from around the world to volunteer, and within two weeks (supported in part by the hastily organized Committee for the Rescue of Italian Art), teams of the world's finest conservators arrived from England, France, Germany, South Africa, and the US.(17) While it is wonderful that charitable individuals and organizations came forward again in 2005 to initiate the Katrina recovery, this sort of happenstance should not be depended upon. In less dramatic events, aid cannot be relied upon to be forth-coming. And, while it is true that most collections pale in significance to Florence's Renaissance treasures, many of the artistic and historic materials damaged in Mississippi and Louisiana remain unique, irreplaceable, and of cultural significance.

16. FROST, Gary and SILVERMAN, Randy, "Disaster Recovery in the Artifact Fields - Mississippi After Hurricane Katrina," *International Preservation News n°37* (December): 35-47.

17. See, for example: BATINI, Giorgio, *4 November 1966: the River Arno in the museums of Florence* (Florence: Bonechi, 1967); WATERS, Peter, "Book restoration after the Florence flood," *Penrose annual* 62 (1969): 83-93; HORTON, Carolyn, "Saving the libraries of Florence," *Wilson Library Bulletin* (June, 1967): 1035-1043; TRIBOLET, Howard W., "Restoration in Florence," and "Florence revisited," in *Florence rises from the flood* (Chicago: R.R. Donnelley and Sons, 1967).

Better responses are needed. The temporary cooperative relationships that occurred between relevant national organizations (e.g., AASLH, AIC) after Hurricane Katrina could be sustained to begin standardizing the training protocols and selection criteria needed for potential volunteers. The short-term, positive energy contributed by professional library, archives, and museum associations[18] could be harnessed ongoing to produce and maintain current contact information for key personnel in cultural heritage institutions nationwide. After a regional disaster, when the street signs are gone and the institutions are locked up, home and cellular phone numbers for numerous staff members are critical to being able to provide assistance, and this information is best collected and updated locally.

In 2005, Heritage Preservation issued the Heritage Health Index, the first comprehensive national survey assessing the condition and preservation needs of US collecting institutions. The survey indicated that 80%, or 24,000 US cultural institutions have no disaster plan that takes collections into account. This figure suggests that "2.6 billion items of historic, cultural, and scientific significance are not protected by an emergency plan and are at risk should a disaster strike their institutions".[19] As things currently stand, immediate outside assistance following a disaster can only be mobilized on an *ad hoc* basis, if at all. The present situation lacks the means to standardize the quality of information or services provided to collections in crisis and the capacity to ensure a timely response. This scenario is irresponsible and will ultimately condemn an untold number of irreplaceable cultural heritage objects to damage and loss.

National Disaster Center for Cultural Property (NDC)

The basic objectives of a **N**ational **D**isaster **C**enter for *C*ultural Property (NDC) include:

a. providing emergency preparedness training for librarians, archivists and museum professionals;
b. providing disaster response training for conservators to help improve response time and to standardize technical protocols;
c. providing immediate, on-the-ground responses to stabilize cultural property in times of emergency;
d. coordinating links between existing national, regional, and state membership organizations to unify national training and recovery initiatives;
e. improving salvage protocols for the wide range of media by stimulating technical research;
f. increasing national awareness about risks to cultural property from disasters and
g. developing funding to support ongoing training and disaster response activities.

a. Emergency preparedness training for librarians, archivists and museum staff

In an effort to keep costs low and to disseminate information broadly, emergency preparedness training could be provided at the national, regional, and state level as pre- or post-conference workshops for library, archives, and museum membership organizations. Trainers in this nationwide effort would be identified within the existing core of experienced

18. In the US these groups include the American Library Association, Society of American Archivists, Council of State Archivists, American Associations of Museums, and their state and regional affiliates.

19. Heritage Preservation, *A public trust at risk:* 6-7. The breakdown by type for US cultural institutions having no emergency plan is: archives, 70%; libraries, 78%; historical societies, 92%; museums, 78% scientific collections, 86%.

disaster responders and might include members of the International Federation of Library Associations and Institutions, Preservation and Conservation Section, North American Network (IFLA-PAC NAN), as well as the 100-plus people previously trained through the AIC "Train the Trainers" program (2000-01). The curriculum for these workshops would be based upon the syllabus agreed upon by the US National Task Force and used in the "Train the Trainers" program.[20] This would include both emergency planning before the fact to minimize damage, and disaster response training after the fact to disseminate effective post-disaster recovery protocols.

With support from national granting agencies (e.g., NEH Education and Training grants), this training could be provided free to participants in exchange for a commitment to draft an institutional disaster plan within six months of attending the workshop. Were this program able to reach the staff of 1,000 institutions annually, it would take approximately 24 years to develop disaster plans for every US cultural institution holding historic or artistic works. If the plans were created electronically and stored centrally, pertinent contact information could be made available (with the institution's permission) to responders to expedite post disaster assessment.

b. Disaster response training for responders

Disaster responders for cultural property typically become involved in recoveries on an *ad hoc* basis without previously receiving formal technical training. There is a need for conservators who are currently familiar with recovery protocols to organize this knowledge into standardized training courses that include all types of heritage media and to share this information widely among their peers. This training could be offered regionally to help defray travel expenses. Trainers for these courses could be screened by AIC for previous disaster experience and training, and participation limited to people willing to become future responders. Prerequisites for trainees would include a good state of mental and physical health, maintaining current immunizations,[21] and a willingness to participate in recovery events. In the case of students currently enrolled in one of the four national conservation training programs,[22] the benefits gained through real world experience would quickly become an invaluable component of their education. A screening process could be set up by the programs themselves to determine the students' interest in and readiness to participate in disaster response training.

Again, the curriculum for training responders would be based upon the National Task Force syllabus with the trainers selected from a national pool of experts currently possessing significant disaster recovery experience, specialized technical expertise, and pragmatic teaching skills.

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20. The National Task Force on Emergency Response curriculum includes the following headings: 1) Introduction; 2) Background; 3) Terminology; 4) Team building and group dynamics; 5) Risk assessment and planning; 6) Health and safety; 7) Supplies, equipment, and resources; 8) Immediate response; 9) Salvage - general methods and guidelines; 10) Salvage - collection specific techniques; 11) Scenario - damage assessment; 12) Debriefing; 13) Evaluation; 14) Bibliographies; 15) Addenda.

21. Immunizations would include tetanus, diphtheria, hepatitis A and B, and influenza inoculations, as well as the use of mosquito repellant, as needed.

22. The four US conservation training programs are: Art Conservation Department at Buffalo State College; Conservation Center of the Institute of Fine Arts at New York University; Kilgarlin Center for Preservation of the Cultural Record at the University of Texas at Austin; and, Winterthur/University of Delaware Program in Art Conservation.

c. Providing immediate, on-the-ground responses

As a prerequisite to providing on-the-ground responses, the NDC would need to develop strong logistical capabilities to:

- remain abreast of ongoing weather and geological events threatening North American cultural property;
- identify quickly the cultural institutions requiring assistance within an affected area and ascertain the post-disaster condition of their cultural holdings;
- determine the significance of the collections affected, the severity of the risk to these collections' survival and the institutions' ability to respond appropriately to the crisis, and
- determine the availability of first responders for the purpose of rapidly assembling and mobilizing teams.

Presently, an immediate NDC response could only be possible as a result of the selfless contributions of concerned, highly-skilled conservators and other emergency responders. Because mitigating threats to cultural heritage collections is part-time work requiring tremendous expertise, responders must be willing to donate their time and expertise for little or no compensation and with very little warning. People selected to participate as an NDC responder would need to successfully complete a responders' training program to ensure that standardized protocols were applied generically by all responders. 30 people could be trained in the first year with an additional 10 added the second year to produce a total of 40 on-call responders nationally, plus a number of students from the conservation training courses.

If possible, responders should be compensated at a fixed daily rate to encourage participation by conservators in private practice, and have all work-related expenses (e.g., travel, lodging, food, equipment, and supplies) covered by NDC. Responders need to have medical coverage provided either by Worker's Compensation Insurance or the insurance policy of their home institution and should operate as consultants, agreeing to indemnify and hold harmless NDC in the case of injuries, damages, or acts of omission. Once trained, responders will maintain the currency of their own immunizations, fit testing for respirators, passport (for operating outside US borders), and agree to remain on call during specified times. A body of trained responders like this could provide backup for each member of the team as some percentage will inevitably find themselves unable to participate on short notice at any given time.

With the onset of an emergency affecting cultural property, a single first responder would immediately be deployed to the affected area to assess the precise need for aid and to make initial contacts with the involved parties. This appraisal might be expedited if this responder happened to live in or near the affected area. As a result of this first assessment, a team of responders would be mobilized to a project work site where they would be met by a mobile job-site trailer. Custom-designed for field operations, this inexpensive (US$ 6,000), non-motorized vehicle could be towed to the disaster site to provide work stations from which responders could help stabilize private and institutional collections. The trailer could contain emergency equipment (e.g., eclectic generator, portable lights, dehumidifiers, fans, ladder, crow bars, etc.), as well as portable conservation provisions necessary to initiate *in situ* drying operations for entire collections, as necessary. When not needed in the field or for training purposes, this vehicle could remain parked on the campus of one of the four national conservation training programs to provide students with additional lab space.

Certified responders would be expected to maintain their own fully stocked emergency backpack (replete with personalized protective gear), to participate in one compulsory training program per year, and produce written reports following each field operation.

As documentation of useful recovery procedures and media-specific protocols accumulated, a manual of low-tech, low-cost stabilization and mass-conservation treatments for cultural property would emerge. This information could be published and updated on the NDC website to benefit responders internationally.

d. Linking efforts with national, regional, and state membership organizations

An ongoing role of the NDC would be to coordinate disaster training and recovery initiatives with existing national, regional, and state membership organizations. This type of coordination takes advantage of the general good will and support expressed for disaster victims in times of crisis and could encourage membership participation in emergency preparedness training programs. NDC could also help define and coordinate disaster response roles for these organizations, keeping their contributions useful by preventing overlap. One previously mentioned area that needs tackling is the creation of a data base containing both work and personal contact numbers for directors plus several levels of backup for each cultural institution nationally. This contact information must include those institutions not currently affiliated with any professional membership organization and is likely best stored centrally but gathered and updated through the local branches of regional or national professional membership organizations.

e. Advancing salvage protocols through technical research

To advance the technical options available to responders, NDC must stimulate research related to the salvage of cultural property. A preliminary step in this effort would be to survey the areas of greatest perceived need (e.g., protocols for drying vellum manuscript books). Once defined, NDC could then help coordinate the submission of grant proposals to address these priorities. A clear need exists to create national vulnerability maps to identify institutional exposures related to natural disasters (e.g., proximity to flood planes, earthquake zones, hurricane zones, tornado zones, etc.). This information would help identify at least some of the institutions currently at risk from natural threats and prioritize them to receive training. A secondary component of this type of mapping could be the development of national resource maps that include primary and secondary evacuation routes for collection transport, location of secure storage facilities, location of freezer plants, proximity to conservation expertise, etc.

f. Increasing national awareness

Raising awareness about risks to cultural property from disasters is a key to improving responsible collection management. Documentation from disaster responders generated by participation in actual recoveries should be cumulated and posted on the NDC's website for access by responders internationally. Attention could also be focused on the field by initiating the Peter Waters Prize,[23] a cast medal awarded annually to an honoree selected for significant contributions to the preservation of cultural property through disaster preparedness and recovery.

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23. Peter Waters (1930-2003) headed the Library of Congress' conservation lab from 1971-1995. His numerous contributions to the field of library conservation include the broad dissemination of heat-set tissue as a repair material, the replacement of lamination with polyester film encapsulation, and the widely adopted principal of "phased preservation." Following the devastating Florence flood of 1966 he served as the first Technical Director to the Biblioteca nazionale, helping design and implement the restoration system employed there. In 1975, he published *Procedures for Salvage of Water-Damaged Materials*, the first manual of its kind and a huge step in the struggle to preserve damaged cultural property. In great demand because of his pragmatism and his technical skills, Waters also advised on the 1988 fire at the Soviet Academy of Sciences in Leningrad (now St. Petersburg) that damaged 400,000 books.

© Randy Silverman

Submerged for 24 hours, CSU's books and journals swelled dramatically.

g. Funding

Funding to support NDC's infrastructure and ongoing training and disaster response activities could be sought through public (e.g., NEH Education and Training grants) and private (e.g., Watson-Brown Foundation; History Channel) sources. Standing agreements could also be forged with insurance companies specializing in covering heritage collections that have a vested interest in mitigating damage to reduce their risk.

To maintain maximum flexibility for initiating rapid responses to emergencies, NDC must retain its autonomy. However, situated within the right university infrastructure, NDC could have access to a strong existing infrastructure (accounting, computer assistance, web design, legal counsel, etc.) key to expediting its formation and to stabilizing ongoing operations. This connection with a nonprofit institution would also permit NDC to apply for large Federal grants to support education and training, as well as to seek private donations.

And, to gain visibility, NDC would benefit from the involvement of a celebrity spokesperson to help influence public opinion and increase awareness about the risks to cultural property. The Center should also design, produce and distribute promotional materials (posters, book marks, published works, etc.) to keep people informed about the issues.

Conclusion

A National Disaster Center for Cultural Property capable of providing immediate emergency assistance to collections in crisis is needed to ensure the preservation of U.S. cultural property. Once operational, this program could focus on strategies for preventing damage to heritage collections, as well as for responding with timely aid when damage occurs. A sweeping education and training program could dramatically increase the number of U.S. collecting institutions with disaster plans in place and consequently help these institutions identify steps to reduce or prevent certain types of collection damage. With 80% of U.S. cultural institutions currently lacking this essential collection management tool, the ongoing cycle of random damage and loss to irreplaceable heritage collections inevitably must be perpetuated.

Most pointedly, the result of continuing to drift without a National Disaster Center cannot help but be the loss of historical perspective occasioned by destruction of the collections in libraries, archives, and museums that are the bedrock of historical writing. These resources are fundamental to telling the stories of libraries, archives, and museums - the institutions to which society has assigned the essential duty of managing the cultural record on which historical understanding is grounded. Sacrificed in loss of the books, papers, and objects in our heritage institutions will be the record of the men and women who created, maintained, and protected these collections against assaults of nature and man alike. They and we deserve better. No group should be more dedicated to joining in bringing a National Disaster Center into existence than the historians who, more than any group, profit from the work it is designed to do.

VERS UN PROTOCOLE NATIONAL DE LUTTE CONTRE LES CATASTROPHES

Randy Silverman, Responsable de la conservation, Université de l'Utah, USA

La prévention des risques est un sujet sensible pour les institutions culturelles parce qu'une catastrophe peut réduire à néant les actions de conservation préalablement mises en place. Les inondations survenues à Florence en 1966 ont influé de différentes façons sur les activités des professionnels de la conservation mais nous devons continuer à tirer les enseignements de cette catastrophe ; 80% des institutions américaines qui rassemblent des collections ne possèdent pas de plan d'urgence. On reviendra brièvement sur deux inondations survenues récemment dans des institutions américaines et sur les effets de l'ouragan « Katrina » dans la région du Golfe du Mexique. On évoquera la nécessité de mettre aujourd'hui en place un Centre national de protection des biens culturels en cas de catastrophe et on examinera les actions prioritaires de ce centre. Par exemple :

- **un vaste programme d'enseignements pour renforcer les actions de prévention des risques ;**
- **une formation pour les structures/personnes chargées des premiers secours afin de normaliser les protocoles d'urgence ;**
- **des procédures permettant de dégager immédiatement des fonds pour une intervention sur le site de professionnels de la conservation lorsque des biens culturels sont menacés ;**
- **et des activités de recherche pour améliorer les différents traitements utilisés après la catastrophe.**

HACIA UN PROTOCOLO DE RESPUESTA ANTE UN DESASTRE NACIONAL

Randy Silverman, Bibliotecólogo en preservación,
Universidad de Utah, Estados Unidos

La preparación contra los desastres es crítica para las instituciones, ya que las acciones dirigidas a la preservación de toda una vida pueden quedar anuladas por un evento catastrófico. De muchas maneras, la inundación de Florencia de 1966 estableció la profesión de la conservación moderna, pero todavía hay que prestarle atención a la verdadera lección de Florencia; el 80% de las instituciones estadounidenses que poseen colecciones actualmente no cuentan con un plan de emergencia. En este trabajo se examinan brevemente dos inundaciones recientes de instituciones de los Estados Unidos y los efectos del Huracán "Katrina" en la región de la Costa del Golfo. Además, se describe la necesidad permanente de establecer un Centro nacional de desastres para la propiedad cultural, y se plantean las prioridades de dicho centro, entre las que se incluyen:

- *educación amplia para incrementar la preparación contra desastres;*
- *capacitación de los primeros socorristas a fin de normalizar los protocolos de recuperación;*
- *mecanismos para financiar una respuesta de conservación inmediata en el sitio cuando exista propiedad cultural en peligro;*
- *e investigación para mejorar las opciones de tratamiento posteriores al desastre.*

Session 2

March 9th, 2006

DISPLAYS: THE ROLE OF PRESERVATION IN EXHIBITION
EXPOSITIONS : DOCUMENTS EXPOSÉS ET CONSERVATION

Moderator: Nancy E. Gwinn
Smithsonian Institution Libraries, USA
Chair, IFLA Section on Preservation and Conservation

* Jocelyne Deschaux, Bibliothèque municipale de Toulouse, France
Les conditions de conservation des documents graphiques et photographiques lors des expositions
Protecting Graphic and Photographic Documents during Exhibitions

* Anne-Hélène Rigogne et Brigitte Leclerc, Bibliothèque nationale de France
Expositions et conservation : de la norme à la réalité
Exhibitions and Preservation: Standards and Reality

* Dianne van der Reyden, Library of Congress, USA
Displays: The Role of Preservation in Exhibitions at the Library of Congress
La place de la conservation dans les expositions à la Bibliothèque du Congrès

LES CONDITIONS DE CONSERVATION DES DOCUMENTS GRAPHIQUES ET PHOTOGRAPHIQUES LORS DES EXPOSITIONS

Jocelyne Deschaux,
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INTRODUCTION

La durée et les conditions d'exposition influent directement sur l'état de conservation des documents. Les risques et les dégradations sont en effet nécessairement amplifiés à cause :

- de l'éclairage obligatoire ;
- des portes ouvertes et de la présence humaine forte (du moins l'espère-t-on) rendant difficile le maintien de valeurs climatiques stables ;
- des documents qui sont maintenus ouverts sur une longue durée et donc plus réceptifs à l'action de la lumière et des variations hygrométriques et plus sujets à une fragilisation mécanique et chimique ;
- de certaines contraintes de présentation allant à l'encontre des principes de conservation : ouverture, inclinaison des documents, et éventuellement hétérogénéité des types de matériaux à l'intérieur d'une même vitrine.

La norme française AFNOR Z 040-010 relative aux « Prescriptions de conservation des documents graphiques et photographiques dans le cadre d'une exposition » publiée en juin 2002, est un document « officiel » très important qui soutient les conservateurs et les établissements dans leurs exigences de conservation au moment des expositions. Trois axes principaux s'en dégagent :

- l'aspect administratif avec l'importance des dossiers à constituer ;
- le document lui-même dans la phase précédant et suivant l'exposition ;
- les conditions de conservation lors de l'exposition.

ASPECT ADMINISTRATIF

L'aspect administratif (la constitution d'un dossier) n'existe pas uniquement pour montrer l'excellence des Français dans le domaine de la paperasserie. Il s'attache à souligner par exemple qu'une demande de prêt ne doit pas se faire au dernier moment, car une acceptation de prêt induit souvent un travail interne en conséquence : reproduction intégrale du document avant le départ, entretien et parfois restauration.

Il est important que plusieurs personnes participent à l'acceptation d'un prêt pour exposition (le responsable scientifique du document mais aussi le responsable de la conservation). Les attestations d'assurance « clou à clou » doivent être parvenues à l'établissement prêteur avant

le départ du document. Cela paraît évident mais c'est de fait toujours un peu difficile à obtenir.

Le contrat de prêt doit, à la fois pour le prêteur mais aussi pour l'emprunteur, spécifier également les conditions de conservation requises par le prêteur. Il sera complété par les constats d'état remplis pour chaque document de manière précise et détaillée, et ce à quatre étapes distinctes et indispensables (au départ, après le transport aller, après l'exposition et après le transport retour) de façon à pouvoir permettre de répartir les responsabilités en cas d'accident, entre le transporteur et l'emprunteur, par exemple.

Enfin, la mémorisation des données dans une sorte de fiche de santé précisera pour chaque document, la durée exacte de l'exposition, les conditions de lumière qu'il y a reçues (luminosité et total en heures du temps d'exposition à la lumière), les conditions thermo-hygrométriques, la ou les page(s) exposée(s) etc. Toutes ces données permettront d'accepter ou de refuser un prêt ultérieur, au vu des prêts antérieurs.

Le document avant et après l'exposition

Il arrive parfois, malheureusement, que les documents soient dégradés, de façon plus ou moins importante, avant ou après l'exposition elle-même. La norme 10-040 attire l'attention sur ces phases critiques que sont l'emballage du document (elle donne les préconisations quant à la nature des différents emballages), ou le transport (par route, par train, par avion). Elle insiste également sur les locaux de stockage dans lesquels les emballages sont conservés pendant l'exposition, qui doivent répondre aux prescriptions de la norme ISO 11799 sur leur salubrité. On a déjà vu en effet des documents être dégradés lors du transport retour par des moisissures qui avaient subrepticement envahi les boîtes de conservation déposées pendant l'exposition dans un lieu humide...

Les conditions de conservation pendant l'exposition

L'apport principal de la norme est sans doute dans la prescription des conditions de conservation pendant l'exposition : conditions climatiques bien sûr qui doivent être poursuivies au-delà des magasins dans les vitrines elles-mêmes, et qui doivent être surveillées et enregistrées tout au long de l'exposition, mais aussi et sans doute surtout conditions de luminosité. La durée des prêts sollicités est souvent beaucoup trop longue (souvent quatre ou six mois).

En effet, même si la luminosité reçue est de 50 lux, si la durée hebdomadaire d'exposition à ces 50 lux est de 45 heures, la durée de l'exposition ne pourra pas excéder cinq semaines s'il s'agit d'un document de la classe « extrêmement sensible » à la lumière (enluminures, encres de couleurs, papier à pâte mécanique, papier calque, tirages photographiques couleur aquarelles)... Car en fait, quand on parle d'exposition, il faut toujours impérativement donner les deux paramètres nécessaires pour évaluer si l'impact de la lumière sera préjudiciable ou non aux documents : le taux d'éclairement reçu, la durée totale en heures de cette réception d'éclairement (c'est-à-dire la durée totale de l'exposition convertie en heures effectives d'ouverture : nombre d'heures par jour multiplié par le nombre de jours dans la semaine multiplié par le nombre de semaines). Si un emprunteur vous parle de 50 lux sans donner la durée en heures, même ces 50 lux peuvent être préjudiciables. A l'inverse, si un emprunteur ne peut respecter 50 lux mais souhaite les documents pour un temps court, on peut les lui accorder si le total ne dépasse pas les doses prescrites par la norme.

La norme nous permet désormais en effet de demander la réduction de la durée d'exposition à la lumière : en donnant clairement les différentes classes de sensibilité dans lesquelles se rangent les différents types de supports ou les différents types de tracés ; en donnant la dose totale d'exposition maximale admise pour chaque classe sur une année, et en indiquant les modes de calcul pour parvenir à cette dose totale reçue, la norme rend les conservateurs plus forts dans leurs exigences de conservation vis-à-vis de la lumière, mais aussi plus forts auprès des services techniques de leur établissement pour demander une protection plus efficace contre la lumière. De la même façon, la norme préconise des moyens de protection pour les sources artificielles et la réduction des infrarouges. Elle insiste également sur les effets cumulatifs de la lumière en précisant que les préjudices de la lumière s'ajoutent, au cours du temps, les uns aux autres : c'est pourquoi un enregistrement des données et des sorties pour expositions est indispensable.

S'agissant des vitrines elles-mêmes, la norme préconise un verre de sécurité feuilleté ou trempé, et recommande de placer à l'extérieur de la vitrine tous les systèmes mécaniques et électriques afin d'éviter l'échauffement intérieur de la vitrine et d'en simplifier l'accès pour la maintenance. Elle insiste également sur les supports de présentation, qui doivent s'adapter aux documents (et non l'inverse...), ne leur imposer aucune contrainte, et respecter les prescriptions de présentation données par le prêteur (en terme d'inclinaison, d'angle d'ouverture). Le support doit donc être réalisé ou choisi une fois la sélection faite de la page du livre à exposer puisqu'il changera du tout au tout si on expose la page de titre (support en marches d'escalier), une page centrale (support en _/) ou une page finale (support en marche d'escalier dans l'autre sens).

L'un des apports déterminants également de la norme est constitué des documents présentés en annexe, donc non normatifs mais extrêmement précieux d'un point de vue pratique. Des exemples de fiches de demandes de précisions sur l'exposition, de fiches de prêt, de contrat de prêt, de constat d'état sont proposés, à charge bien sûr pour chaque établissement de les adapter pour ses besoins réels. De même, elle fournit une liste extrêmement précieuse des matériaux recommandés ou au contraire à proscrire pour la composition des vitrines et des supports, par grande catégorie (bois, matières plastiques, verre, métal, textiles, peintures, vernis et cires, adhésifs).

Pour pouvoir concilier conservation et mise en valeur des documents pour lesquels nous avons la mission de conservation.

SENSIBILITÉ DES DOCUMENTS

Les documents graphiques et photographiques sont à considérer comme faisant, dans leur grande majorité, partie des objets patrimoniaux les plus sensibles à la lumière. En fonction des matériaux qui les constituent ainsi que de leur état de conservation, il est convenu de les répartir en trois catégories suivant leur sensibilité à la lumière, à savoir :

Classes de sensibilité à la lumière

Classes de sensibilité	Supports	Encres, tracés, couches sensibles
Documents fortement sensibles	Papier pâte chimique Papier pâte chiffon	Encres noires d'imprimerie Encres noires manuscrites Graphite Tirages photographiques noir et blanc sur papier baryté
Documents très fortement sensibles	Parchemin	Tirages photographiques noir et blanc sur papier plastifié
Documents extrêmement sensibles	Papier pâte mécanique Papier calque Papier pelure	Encres de couleur Enluminures Feutres Aquarelles Pastels Gouaches Détrempes Tirages photographiques couleur Tirages photographiques XIX^{e} siècle

Tout document très dégradé est à classer dans la catégorie la plus sensible. Si le document est composé de constituants relevant de plusieurs catégories, il convient de toujours retenir la catégorie la plus contraignante en termes de conservation. De la même façon, en cas de doute, le document doit être classé dans la catégorie la plus sensible.

MAÎTRISE DU RAYONNEMENT VISIBLE

Dose **t**otale d'**e**xposition (DTE)

Tout comme le rayonnement UV, le rayonnement visible, particulièrement les radiations de faible longueur d'onde (du violet au vert), représente une menace pour l'intégrité des documents. En fonction de leur classe de sensibilité, il ne faut pas dépasser les valeurs d'exposition lumineuse [ou Dose Totale d'Exposition (DTE)], données ci-dessous. La DTE correspond au produit de l'éclairement (en lux) par la durée totale d'exposition (en heures) sur une année.

Dose totale d'exposition

Classes de sensibilité	Dose totale d'exposition maximale admise
Insensible	---
Sensible	600 000 lxh/an
Très sensible	150 000 lxh/an
Fortement sensible	84 000 lxh/an
Très fortement sensible	42 000 lxh/an
Extrêmement sensible	12 500 lxh/an

NB : en grisé les catégories relatives aux documents graphiques et photographiques.

Note 1 : l'éclairement, dont l'unité est le lux, se mesure au moyen d'un luxmètre.

Note 2 : l'action de la lumière sur les matériaux étant cumulative, l'action de dégradation est la même si les documents sont exposés à un éclairement de 50 lux durant 3000 heures tous les ans ou de 150 lux durant 3000 heures une fois tous les 3 ans.

PRESERVATION CONDITIONS IN EXHIBITIONS

Jocelyne Deschaux, Chief Librarian in charge of the written heritage,
Public Library, Toulouse, France

Exhibiting old rare and valuable materials goes against some efficient preservation conditions. Instructions are given in the French standard NF 40-010 in order to respect preservation principles when exhibiting documents. Three major points are discussed:

- **the running of the materials (more particularly the transport and the different moments when the documents should be inspected);**
- **the exhibit cases (and the list of prohibited and recommended materials);**
- **the environmental conditions (more particularly the intensity of light).**

This standard allows the professionals in charge of the holdings to be firmer regarding preservation conditions, to give their approval or refuse loan requests, and to plan or refuse the exhibitions organised by the institution; this should give us the possibility to keep highlighting valuable materials without damaging them.

CONDICIONES DE CONSERVACIÓN DURANTE LAS EXPOSICIONES

Jocelyne Deschaux, Conservador Jefe, Responsable del patrimonio escrito,
Biblioteca municipal de Tolosa, Francia

Las exposiciones incrementan todos los riesgos que corren los documentos antiguos raros o preciosos para su buena preservación. La norma francesa NF 40-010 establece los parámetros que se deben respetar para que las exposiciones no vayan en contra de los principios de conservación. Estos parámetros se desarrollan en tres direcciones:

- *el aspecto administrativo que hace énfasis en el transporte y la verificación del estado de los materiales en las diferentes etapas;*
- *los soportes de presentación de las obras (principalmente con la lista de los materiales prohibidos y recomendados);*
- *las condiciones termohigrométricas y, sobre todo, de iluminación.*

Esta norma permite fortalecer a los responsables de los fondos en cuanto a sus exigencias en materia de conservación, para aceptar o no las solicitudes de préstamo o para la planificación de exposiciones internas en la institución, con el propósito de continuar valorizando los documentos que están a su cargo, sin menoscabo de su potencial de conservación.

EXPOSITIONS ET CONSERVATION : DE LA NORME À LA RÉALITÉ

Anne-Hélène Rigogne, Conservateur en chef, adjointe au chef du service des expositions, et Brigitte Leclerc, Ingénieur au laboratoire du département de la Conservation, Bibliothèque nationale de France (BnF)

INTRODUCTION

Cette intervention sur le thème « Expositions et conservation » vise à livrer notre expérience concrète du terrain qui s'appuie sur les principes de la norme précédemment développée, mais qui, du fait de certaines contraintes, s'écarte parfois du modèle de « l'exposition idéale ». Nous illustrerons notre propos par quelques exemples concrets. Nous ne développerons que certains points abordés par la norme pour ne pas alourdir notre présentation (durée d'exposition, choix des pièces, salles d'exposition, mobilier et scénographie, dispositifs de présentation des documents, planification des travaux et du montage, surveillance des conditions climatiques, éclairage, constats d'état...).

Le service des expositions de la BnF comprend deux parties :

- le service des expositions extérieures : cellule chargée des prêts de la BnF à des organisateurs d'exposition, qui se soucie donc, en lien avec les départements, du respect « absolu » de la norme, et
- le service des expositions intérieures qui se doit également d'appliquer la norme autant que possible dans les expositions organisées dans l'établissement.

A titre indicatif, plus de 3500 documents par an sont prêtés par le service des expositions extérieures, et environ 14 expositions par an sont organisées par le service des expositions intérieures, grandes expositions comme « Lumières ! » que nous venons d'inaugurer, de taille moyenne comme « Madame du Châtelet » à Richelieu, et de simples accrochages de photographies, ou estampes.

Le laboratoire du département de la Conservation intervient en appui scientifique et technique dans le suivi régulier des expositions à tous les stades où cela est nécessaire.

CONCILIER DES MISSIONS APPAREMMENT CONTRADICTOIRES : EXPOSER ET CONSERVER


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Exposition « Lumières ! Un héritage pour demain », mars-mai 2006, Bibliothèque nationale de France (Site François-Mitterrand).

Nous intégrons dans toute la mesure du possible les principes de la conservation dès la conception de l'exposition afin d'avoir les meilleures chances que tous les dispositifs nécessaires soient en place pour toute la durée de l'exposition.

En effet, le respect des meilleures conditions de conservation pour chaque ouvrage ou objet, en matière de conditions climatiques, d'éclairement, de confort physique, sans nuire à l'esthétique, à la bonne visibilité, au message (contenu, discours) véhiculé par l'exposition, nécessite une réflexion commune impliquant les organisateurs (conservateurs responsables des documents, commissaires d'exposition, chargés d'exposition), le scénographe, les services techniques, les monteurs en exposition ou les restaurateurs, les spécialistes de la conservation (scientifiques, laboratoire).

Evoquons quelques points abordés dans la norme.

1. La durée de l'exposition

Certains d'entre vous ont vu tout à l'heure l'exposition « Livres de parole : Torah, Bible, Coran » qui est un bon exemple d'application de la norme. En effet, cette exposition dure six mois, ce qui pourrait faire réagir des spécialistes de la conservation. La raison de cette durée longue est le contenu pédagogique de l'exposition. Une durée d'exposition longue est nécessaire pour installer l'action pédagogique dans la durée de l'année scolaire, visites pour les enseignants, organisation des visites pour les élèves. Pour répondre aux contraintes de Dose Totale d'Exposition (DTE) lumineuse par an pour les objets extrêmement sensibles que sont les documents graphiques et photographiques, nous organisons à mi-parcours une rotation des documents, que ce soit par simple changement de page, ou d'exemplaires. Au vu de la rareté du corpus exposé, certains documents sont irremplaçables. Vous comprenez qu'il s'agit d'une contrainte forte dans le choix des pièces exposées, et en termes d'organisation, d'un petit montage et démontage d'exposition en deux jours. Pour l'exposition « Au bonheur des dames » nous avons même exposé pour la deuxième partie des impressions de très bonne qualité des manuscrits de Zola, en le mentionnant sur le cartel, je vous rassure.

2. Le choix des pièces

Pour tout mouvement d'œuvre, que ce soit auprès d'un prêteur extérieur ou auprès d'un département de la BnF, une demande écrite est formulée.

Le choix des pièces se fait bien sûr en fonction du contenu intellectuel et du thème de l'exposition, mais aussi en fonction de leur état physique et de leur fréquence d'exposition. On veille en effet, dans la mesure du possible, à ce qu'une œuvre extrêmement sensible ne soit pas systématiquement choisie quand une autre peut la remplacer.

Le choix des pièces se fait en principe plusieurs mois avant le début de l'exposition. Il est communiqué aux responsables de collections qui nous retournent un formulaire permettant de préciser un certain nombre de renseignements en vue de préparer la présentation des

documents dans les meilleures conditions de conservation :

- état de conservation et fragilité (faut-il prévoir une restauration avant l'exposition ?) ;
- degré d'ouverture toléré ;
- dimensions ;
- nature des matériaux (dont les exigences en matière d'humidité relative par exemple sont variées) ;
- historique de leurs conditions de conservation avant l'exposition.

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Exposition « Lumières ! Un héritage pour demain », mars-mai 2006, Bibliothèque nationale de France (Site François-Mitterrand).

3. Les salles d'exposition

En principe, le climat (température et humidité relative) dans la salle d'exposition devrait être conforme à la norme ISO 11799, c'est à dire plus précisément en adéquation avec la nature des matériaux qui y sont exposés. Ces conditions climatiques devraient être obtenues et maintenues stables grâce à la climatisation. La climatisation d'un édifice comme le site François-Mitterrand a mis du temps à se stabiliser, mais est maintenant globalement satisfaisante en ce qui concerne les salles d'exposition. Mais la situation est parfois plus compliquée sur nos sites plus anciens, où les salles n'étaient pas initialement destinées à accueillir des expositions et où le système de climatisation doit encore être amélioré. Pour garantir des conditions de conservation optimale, un microclimat adapté aux œuvres présentées est créé au sein de la vitrine qui leur sert d'écrin et de protection vis-à-vis des risques extérieurs (public, poussière…).

Un exemple qui montre bien la complexité du problème est la présentation des Globes de Coronelli installés de façon permanente dans le Hall Ouest de ce site. Ce hall n'est à priori pas destiné à l'exposition. La scénographie prendra au mieux en compte les exigences de la conservation en matière de climat et de lumière en les intégrant de la façon la plus positive et discrète possible. Les services techniques recherchent également des solutions pour maintenir un climat adéquat et stable dans cette espace « ouvert » qu'il est difficile de cloisonner si l'on veut que le système climatique tel qu'il a été conçu fonctionne de façon satisfaisante.

4. Le mobilier d'exposition et la scénographie

Nous possédons un mobilier permanent que nous utilisons régulièrement en l'intégrant aux scénographies.

Ce mobilier est de deux types :

- des vitrines acquises à une époque où le souci de la conservation n'était pas encore intégré dans le mobilier. Nous les utilisons en imaginant pour chaque exposition les solutions les plus adaptées et les plus discrètes possibles pour disposer les matériaux-tampons (silica-gel) assurant la stabilisation de l'humidité relative à la valeur désirée ;
- des vitrines datant de l'ouverture de Tolbiac (1996) intégrant des tiroirs permettant de disposer ces matériaux.

Pour des cas particuliers, nous concevons et faisons réaliser des dispositifs spéciaux adaptés à l'œuvre : vitrines murales, encadrement pouvant inclure l'œuvre, les matériaux-tampons et absorbeurs de polluants, le capteur pour le contrôle climatique.

Par exemple, pour l'exposition « Les Couleurs de la terre », des encadrements spéciaux ont été conçus et réalisés par un restaurateur de la BnF et le laboratoire pour permettre la présentation des deux faces d'un portulan, en incluant le silicagel comme élément de décoration !

Nos expositions temporaires sont scénographiées par des architectes sur la base de cahiers des charges reprenant l'essentiel des recommandations de la norme. Le contrat stipule que les conditions de présentation des documents doivent être respectées.

Malgré l'attention apportée à la conception, l'étape de la réalisation (la construction) réserve parfois des surprises. Nous restons vigilants tout au long de cette étape. Les délais étant souvent très serrés pour l'intervention des différents corps de métiers puis pour le montage de l'exposition (mise en place des œuvres), le moindre « grain de sable » devient difficile à gérer.

Une des difficultés par exemple, est d'obtenir une bonne étanchéité des vitrines sur le mobilier construit pour une exposition temporaire. Ainsi, pour l'exposition « Brouillons d'écrivains », nous avons dû mettre au dernier moment un joint (ruban) de mousse pour étanchéifier les vitrines voulues par l'architecte, vitrines en plexiglas de grand volume, pour permettre aux manuscrits de donner l'illusion de flotter.

Lors d'une autre exposition, « Paysages et paysans », l'utilisation de bois frais dans la scénographie nous a réservé une fâcheuse surprise. Durant l'exposition, de gros insectes (guêpes du bois), heureusement sans danger pour les collections présentées, se sont échappés de poutres en sapin. Il a fallu les capturer en vol, ce qui ne fut pas une mince affaire !!!

Lors de l'exposition « La Mer », le laboratoire a détecté grâce aux capteurs de contrôle du climat une vitrine en surchauffe, ce qui était dû à un éclairage placé sous la vitrine pour donner un effet translucide et aquatique. L'éclairage était trop près des documents. Les techniciens ont pu intervenir immédiatement pour résoudre le problème.

Pour conditionner les vitrines et encadrements dans des conditions climatiques optimales pour les œuvres qui y sont exposées, nous utilisons du silicagel sous différentes présentations : cassettes, sachets, feuilles, grains en vrac. Ce matériau-tampon permet de créer et de maintenir des conditions climatiques choisies et stables dans un petit volume clos à condition que celui-ci soit raisonnablement étanche. Il est capable de protéger le volume clos constitué par la vitrine, des variations d'humidité qui pourraient survenir dans la salle d'exposition et ceci indépendamment de la température. Le laboratoire se charge du conditionnement du silicagel à l'humidité relative adaptée aux documents ou objets présentés. Ce traitement du silicagel se fait en enceinte climatique et nécessite une durée de trois semaines, délai incompressible que l'on doit prendre en compte dans l'organisation de l'exposition. Le service des expositions nous communique donc à l'avance le nombre de vitrines et leurs dimensions ainsi que la nature des matériaux exposés pour que nous puissions calculer le plus justement possible les quantités de silicagel nécessaires pour chaque vitrine ainsi que le taux d'humidité relative adapté.

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Exposition « Lumières ! Un héritage pour demain », mars-mai 2006, Bibliothèque nationale de France (Site François-Mitterrand).

Parfois, plusieurs matériaux ayant des exigences différentes cohabitent dans la même vitrine, situation que nous évitons autant que faire se peut. C'est le cas malgré tout quand il s'agit d'une œuvre composite ou lorsque la cohérence du discours de l'exposition le réclame. Nous déterminons alors une humidité relative de compromis qui ne nuise à aucun des composants (matériaux).

5. Les dispositifs de présentation des documents

Comme nous l'avons déjà évoqué, ces dispositifs sont préparés en amont en concertation entre responsables de collections, restaurateurs et scénographes (choix des soclages, des encadrements). Les matériaux utilisés sont des matériaux dont la qualité est compatible avec la conservation des œuvres. Ils ont été testés en majeure partie par le laboratoire. Les supports de présentation sont le plus souvent réalisés sur mesure pour chaque document en fonction de ses dimensions, de son degré d'ouverture, de la page présentée, de l'inclinaison voulue.

Nous avons la chance d'avoir à la BnF un atelier qui façonne ce type de support, ce qui n'est évidemment pas le cas pour toutes les bibliothèques.

Un exemple : pour l'exposition « Victor Hugo » qui présentait de manière identique, manuscrits et dessins, pour montrer la fabrique de l'œuvre, l'idée du scénographe était de présenter les dessins à plat comme sur la table de Victor Hugo, qui n'a jamais considéré cette activité comme importante. Nous avons donc réfléchi avec l'entreprise chargée de la présentation à un système de vitrines avec un passe-partout unique de la taille de la vitrine et des découpes faites *in situ*. Pour réguler l'humidité relative, nous avons utilisé du silicagel en feuilles pour garder la légèreté de la présentation.

6. La planification des travaux et du montage

Nous veillons à ce qu'il n'y ait pas d'interférence entre les travaux liés à la scénographie et ceux de l'installation des pièces : pas d'échelles au dessus des vitrines ouvertes, pas de peinture pendant l'installation des documents, les travaux de peinture devant être finis plusieurs jours avant l'installation des pièces pour permettre le séchage et l'évaporation des solvants.

7. La surveillance des conditions climatiques

Pendant la durée de l'exposition, il est indispensable de suivre et d'archiver les données climatiques.

Le laboratoire se charge de la surveillance des conditions de température et d'humidité relative dans les salles d'exposition et les vitrines. Nous disposons d'un système constitué de capteurs électroniques qui transmettent les données enregistrées par ondes radio sur les ordinateurs du laboratoire. Nous pouvons donc suivre en temps réel les conditions qui règnent dans les expositions et ainsi réagir au plus vite dès qu'une anomalie est constatée.

Ce système sur son principe est très satisfaisant et nous affranchit de toutes liaisons par fils ou bien de l'ouverture des vitrines pour recueillir les données. Mais les esthètes trouveront sans doute la taille et le design des capteurs un peu décevants !… Nous essayons dans la mesure du possible de les dissimuler derrière des pièces de grande taille, mais ce n'est pas toujours possible ! Espérons que l'avenir verra leur miniaturisation…

Pour des raisons de coût, nous ne disposons pas d'autant de capteurs que de vitrines.
Nous choisissons donc, en concertation avec les conservateurs, les pièces qui requièrent la surveillance la plus rapprochée (préciosité, rareté, matériaux, exigences d'un prêteur).

Les autres pièces peuvent être surveillées grâce à de petits thermohygromètres discrets, à lecture instantanée, qu'on a pris le soin d'étalonner.

8. L'éclairage et sa mesure

La lumière est également l'objet de toutes les attentions du fait de la nocivité et de l'effet cumulatif de ses différentes composantes (lumière visible, rayons ultraviolets et infrarouges) sur les matériaux extrêmement sensibles de nos œuvres. L'éclairage naturel est supprimé, soit que les salles d'exposition n'aient pas de baies vitrées (à Tolbiac, par exemple), soit que les fenêtres soient occultées par des stores ou drops très opaques (Richelieu par exemple). Nous utilisons donc des sources lumineuses artificielles qui sont toujours placées, ainsi que leur générateur, à l'extérieur des vitrines, pour éviter une augmentation de température préjudiciable à la conservation. Ces éclairages sont équipés de filtres atténuateurs et/ou anti-UV si nécessaire.

C'est la **D**ose **T**otale d'**E**xposition (DTE), c'est-à-dire le produit de l'éclairement (en lux) par la durée d'exposition (en heures) sur une année qui importe pour la conservation de l'œuvre. La norme indique des DTE en fonction de la sensibilité des documents. Cela permet, en connaissant la durée de l'exposition, de fixer le niveau d'éclairement à ne pas dépasser.

Lors du montage de chaque exposition, les éclairagistes choisissent avec soin les sources lumineuses et leur positionnement afin de respecter les consignes en matière d'éclairement et de quantité d'ultraviolet, tout en faisant en sorte de donner une bonne lisibilité des œuvres exposées. Des mesures sont réalisées au moyen de luxmètres et d'UV-mètres.

Pour évaluer la Dose Totale d'Exposition des Globes de Coronelli, nous allons nous doter de capteurs électroniques lux-UV qui fonctionnent sur le même principe que les capteurs T°C/HR évoqués plus haut.

Diverses solutions peuvent être imaginées pour respecter la DTE. Pour l'exposition « Utopie », l'éclairage de la vitrine de présentation de l'un des quatre exemplaires existants de la Constitution américaine s'allumait seulement lors de la présence d'un visiteur devant le document.

9. Les constats d'état : une étape très importante.

Ils sont souvent très minutieux avec nos collègues des musées, mais plus difficiles à obtenir des conservateurs de bibliothèques, nos vieux ouvrages se prêtant plus difficilement à un examen page par page. Si un document s'avère endommagé (reliure, traces suspectes), notre régisseur des œuvres note les observations par écrit de manière contractuelle avec le responsable de collection. Et une ou deux fois, nous sommes retournés à ce constat d'état avec soulagement, pour constater qu'une dégradation y était bien mentionnée, alors que notre mémoire était défaillante.

C'est lors du constat d'état que l'on recherche par exemple si l'œuvre est contaminée par des moisissures ou des insectes. En cas de suspicion, le laboratoire est immédiatement averti et réalise les analyses nécessaires et dans le cas d'une infestation avérée, fait réaliser les traitements nécessaires (désinfection, anoxie…), évitant ainsi la contamination des autres pièces exposées. Le délai suffisant (de six semaines à deux mois), qui serait idéal entre le constat d'état et le début de l'exposition pour résoudre au mieux ces éventuels problèmes sanitaires, est très difficile à respecter car souvent les œuvres sont vues pour la première fois quand elles arrivent pour le montage.

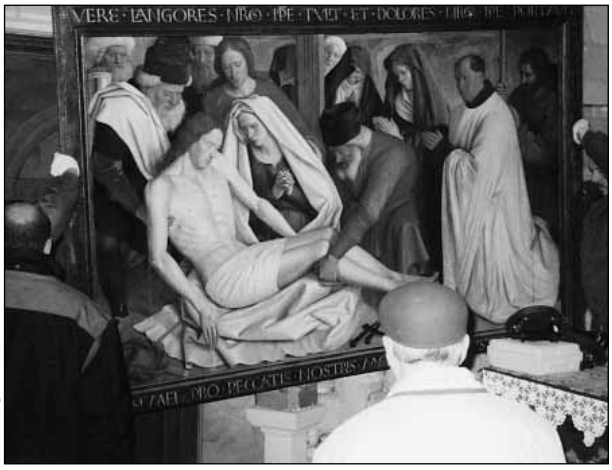
L'arrivée des documents, malgré toute notre vigilance, est quelquefois pleine de surprise surtout pour les emprunts. Nous nous souvenons d'une exposition de costumes. Deux ou trois d'entre eux venus d'une réserve de théâtre étaient mités. Nous avons consulté une collègue du laboratoire de recherche des monuments historiques, spécialiste des mites, et appris que la solution était de congeler pendant un week-end les costumes contaminés pour tuer les larves, ce qui fut fait avec efficacité mais… sans trop de publicité.

De la même façon, des tableaux de la maison Emile Zola infestés également par des mites ont du être traités en catastrophe... Comme la durée du traitement par anoxie (trois semaines) rendait les tableaux indisponibles pour le début de l'exposition, des fac-similés ont été installés temporairement pour pallier ce manque et maintenir la cohérence de l'exposition.

UNE AVENTURE ÉDIFIANTE

Pour terminer, voici l'aventure la plus complexe en termes de dispositif qu'il nous soit arrivé de traiter : le prêt du retable « La Pieta » de Jean Fouquet.

Du 25 mars au 22 juin 2003, le tableau « La Pieta » était la pièce monumentale et majeure sans laquelle l'exposition sur Jean Fouquet, illustre peintre et enlumineur du XV^e^ siècle, n'aurait pas eu tout son sens, puisqu'il était le plus grand des cinq tableaux restant au monde de cet artiste. Il a été prêté à la BnF par la commune de Nouans-lès-Fontaines (en Indre-et-Loire, à 250 km de Paris).



Transport du retable « La Pieta » de Jean Fouquet vers un chevalet en vue du constat d'état de l'œuvre.

C'est un tableau constitué de neuf panneaux de bois (du noyer), pesant environ 100 kg et mesurant avec son cadre (en noyer également) 2,37 m de long, 1,46 m de hauteur et 2,8 cm d'épaisseur, présenté habituellement sous vitrine de protection dans l'église de la commune.

Pour différentes raisons administratives, nous n'avons disposé que de six semaines pour effectuer toutes les opérations techniques préalables à son exposition dans des conditions de conservation satisfaisantes.

Ce délai très court a vu se succéder plusieurs interventions, a nécessité la collaboration de nombreux intervenants (conservateurs de la BnF, service expositions, mairie de la commune, conservateur des services de la direction régionale des Affaires culturelles, restaurateurs de la BnF et privés, laboratoires spécialisés en conservation – Bibliothèque nationale de France et laboratoire de recherche des monuments historiques –, photographe, menuisier et serrurier, entreprise de désinsectisation, société spécialisée dans l'emballage et le transport d'œuvres d'art). Une planification très précise et de nombreux voyages entre Paris et Nouans-lès-Fontaines ont été nécessaires.

En premier lieu, le constat d'état du tableau a révélé une suspicion d'attaques par des insectes xylophages. Comme il était prévu d'installer le tableau dans un caisson climatique, il n'était pas envisageable de prendre le risque que l'attaque des insectes se développe et détériore le bois pendant les trois mois de l'exposition. Un traitement par anoxie (privation d'oxygène) a donc été mis en œuvre pendant trois semaines pour tuer les insectes présents. Pour traiter une pièce de cette taille, que nous devions garder impérativement en position verticale, il fallut toute l'ingéniosité de l'entreprise de désinsectisation.

En deuxième lieu, il s'agissait d'assurer au tableau les meilleures conditions d'exposition possibles en matière de climat, ce qui fut également source de complication. En effet, la température et l'humidité de l'église à cette époque de l'année était voisines de 5°C et de 75% d'humidité relative. Bien que cette hygrométrie ne soit pas celle recommandée habituellement pour la conservation du bois, nous avons décidé de la maintenir à ce niveau pendant toute la durée de l'exposition pour ne pas provoquer de chocs climatiques néfastes au bois. Cette continuité climatique a donc été assurée grâce à un « caisson climatique » pendant toute la durée de l'exposition et jusqu'au retour de l'œuvre dans l'église, après s'être assuré qu'aucune contamination par les moisissures n'était présente.

© Brigitte Leclerc

Mesure du taux d'oxygène résiduel dans l'enveloppe pour s'assurer du respect des conditions du traitement en anoxie.

Après un dépoussiérage soigneux effectué par des restaurateurs, le tableau a été installé dans une vitrine en bois et plexiglas, étanche, conditionnée en humidité relative grâce à des feuilles de silicagel. La vitrine a été conçue par les restaurateurs de la BnF et réalisée par des artisans (menuisier et serrurier). Le choix des matériaux constituant la vitrine a été effectué avec le plus grand soin pour leur qualité de conservation : bois multipli, feuille thermoadhésive d'aluminium étanche à l'air (Marvelseal), carton neutre, peinture à émulsion sans alkydes, acier galvanisé, mousse et joint de Plastazote (mousse de polyéthylène), Plexiglas. Outre les feuilles de silicagel conditionné pour maintenir dans la vitrine une humidité de 65 à 70%, nous avons inclus des feuilles de charbon actif pour absorber les polluants. Le tableau a été installé « en suspension » dans cette vitrine de façon à ne pas être directement en contact avec le silicagel bien sûr, et à permettre à l'air de circuler et de s'homogénéiser tout autour du tableau. Deux capteurs électroniques de température et d'humidité relative à transmission radio ont été placés dans la vitrine pour suivre ces paramètres en temps réel au laboratoire, une fois la vitrine installée à la BnF.

L'ensemble vitrine + tableau pesait 300 kg et, suivant les exigences du prêteur, devait toujours rester vertical. Une caisse de transport capitonnée de mousse a été fabriquée sur mesure par le transporteur pour protéger la vitrine. L'ensemble caisse + vitrine + tableau pesait 600 kg ! Les quelques photos ci-jointes vous permettront d'apprécier les difficultés de manipulation… même pour des techniciens expérimentés. La vitrine a été ainsi transportée en camion isotherme (escorté par la police !), puis installée avec succès dans notre salle d'exposition où nous avons suivi son climat intérieur pendant les trois mois d'exposition. A l'issue de l'exposition, le voyage inverse, avec les mêmes contraintes et précautions, a permis le retour de « La Pieta » dans son environnement habituel. Durant les trois mois d'exposition, les conditions climatiques de l'église de Nouans-lès-Fontaines ont été enregistrées. Au retour du tableau, les conditions climatiques dans l'église différaient légèrement de celles qui régnaient au moment du départ. Nous avons donc procédé à une réacclimatation progressive du retable sur plusieurs semaines pour laisser au bois le temps de se remettre en équilibre avec l'environnement dans l'église.

© Brigitte Leclerc

Cette expérience reste exceptionnelle dans notre quotidien, mais illustre bien la complexité technique de nos expositions où sont présentées de plus en plus souvent des pièces variées, autres que des documents graphiques ou photographiques, et où le nombre d'œuvres exposées est souvent très important.

Retour de « La Pieta »
dans l'église de Nouans-lès-Fontaines.

EXHIBITIONS AND PRESERVATION: STANDARDS AND REALITY

Anne-Hélène Rigogne, Assistant Chief of the Exhibitions Department and
Brigitte Leclerc, Engineer, Preservation Department, National Library of France

On the basis of our experience at the National Library of France, we will discuss the respective points of view of the professional in charge of mounting an exhibition and of the one making sure that standards for good preservation conditions are applied.

Documents chosen as well as the period of the exhibition and the scenography can change for preservation reasons. The facilities as well as the furniture and temporary elements of the scenography should be in adequacy with good preservation conditions. On the other hand, the different phases of the implementation are planned in order to preserve the documents. For the same reasons, the professionals working on the documents are all selected for their specific skills.

We will choose some practical examples to show which procedures must be absolutely applied; we will also give an idea of the surprises that might be in store on mounting an exhibition.

EXPOSICIONES Y CONSERVACIÓN: DE LA NORMA A LA REALIDAD

Anne-Hélène Rigogne, Adjunta al Jefe de servicio de exposiciones,
y Brigitte Leclerc, Ingeniero del laboratorio del departamento de conservación,
Biblioteca nacional de Francia

A partir de la experiencia de las exposiciones de la Biblioteca nacional de Francia, se presentan los puntos de vista cruzados de una organizadora de exposiciones y una responsable de conservación acerca de la aplicación de la norma.

Las condiciones de conservación, que van desde la duración de las exposiciones hasta la selección de los documentos, pueden hacer variar el contenido de una exposición. De igual manera, pueden influir en su concepción escenográfica. Los locales, mobiliario y escenografías temporales deben adaptarse a estas exigencias. Igualmente, la organización del trabajo y la calificación de quienes intervienen los documentos se prevén en función de los documentos expuestos.

A partir de algunos ejemplos concretos, se muestran los procedimientos que deben seguirse estrictamente y las sorpresas pueden reservarse para los montajes de exposiciones.

DISPLAYS: THE ROLE OF PRESERVATION IN EXHIBITIONS AT THE LIBRARY OF CONGRESS

Dianne van der Reyden,
Director for Preservation, Library of Congress

INTRODUCTION

Preservation has played a major role in libraries since the days of the great library of Alexandria, but even then it couldn't safeguard against catastrophic disaster. Today's ability to digitize collections provides a measure of increased security, since informational content can be captured and scattered among many repositories, though it may take many more years (and new self-replicating biotechnologies) to solve the problem of permanent accessibility to electronic copies of collections. But preserving the information, or even the appearance of books, manuscripts, maps, prints and photographs in digital or other formats doesn't preserve the evidence inherent in these materials - that is, the chemical composition of the vast and varied original inks, pigments, dyes, paper, vellum, and leathers selected by the original authors, artists or craftsmen. This chemical composition can help authenticate works and inform diligent scholars, historians or scientists of creative and technical developments, trade, and other social interactions. This inherent information lies embedded in the original, awaiting new forensic technologies to unlock more secrets through materials science. But chemical composition is not a fixed state. All materials degrade over time, yielding less information, and never more so than when used or put on display.(1)

Ironically, libraries are becoming increasingly dependent on displaying their collections, both on- and off-line.(2) Exhibitions now play a greater role than ever in libraries as a way to educate, entertain and attract scholars, the general public and donors, as well as advocate knowledge, understanding and preservation of cultural heritage. Exhibits often mark important gifts or anniversaries. Alert conservators and librarians welcome this increased role of exhibition, and see displays as another means to promote access to and awareness of collections. Despite the tremendous resources of time, staff, materials, space and funds required by exhibitions, conservators and librarians should be eager to collaborate in the exhibit process for the good of the institution and the advancement of knowledge.

The Library of Congress now has a half-dozen inhouse galleries, and as many off-site venues hosting scores of exhibitions each year. Thousands of books, manuscripts, maps, cartoons, prints, drawings and photographs are exhibited annually, and hundreds require special preservation attention.

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1. ANSI/NISO Z39.79-2001. Environmental Conditions for Exhibiting Library and Archival Materials. Bethesda, MD: NISO Press, p.16

2. MARCUM, D. The Relationship of Scholars to Libraries in the Digital Age: The Challenge of Preserving and Making Available Digital Information, Third Annual Prelec Memorial Lecture, Oct. 1, 2003. (Accessed 2/14/06).

There is a wealth of basic information about exhibition of library materials published and on the Internet,[3] including a brochure by IFLA on "Guidelines for Exhibition Loans".[4] The Library of Congress even has special regulations governing exhibitions, and an Exhibition Policy Review Committee that meets monthly.

It is widely noted in the literature and by professionals that the following exhibition pitfalls can jeopardize library materials:[5]

- lack of time, staff and resources for proper conservation and preparation of materials;
- selection of unstable collection items;
- exposure to harmful environments of light, humidity, temperature or pollution;
- use of unstable or inappropriate housing, mount and display case materials and techniques;
- lack of proper handling and security.

This paper intends to outline ways to avoid these pitfalls, by focusing on:

- coordinating time, staff, and resources for proper conservation and preparation of materials;
- selecting stable collection items;
- setting, monitoring and controlling appropriate environments of light, temperature, humidity, pollution, pests and fire protection;
- using appropriate housing, mount and case materials and techniques;
- using appropriate handling and security procedures.

In the interest of brevity, emphasis will be on references and guidelines pertaining to the above.

Coordinating Time, Staff, and Resources for Proper Conservation and Preparation of Materials

The single most important factor in protecting collections from damage during exhibition is the inclusion of preservation personnel in the earliest stages of exhibit planning.[6]

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3. For just some examples, see the following:
- VAN DER REYDEN, D. 1984, rev. 1999. Exhibition Installation and Dismantling. http://www.si.edu/SCMRE/relact/docexhibition.htm (Accessed 2/14/06).
- Library and Archives of Canada. 1996. *Bibliography of Standards and Selected References Related to Preservation Libraries, editors, S. Dodson and J. Wellheiser:* Chapter 6: Exhibition. http://www.collectionscanada.ca/8/14/r14-206-e.html (Accessed 2/15/06)
- NICHOLSON, Catherine. 1993. What Exhibits Can Do to Your Collection. *Restaurator* 13(3):95-113.
- PILETTE, R. 2000. Exhibition Policy and Preparation. IN: *Preservation: Issues and Planning*, editors: Paul Banks and Roberta Pilette, 185-205. Chicago; London: American Library Association.
- RAPHAEL, T. *Exhibit Conservation Guidelines: Incorporating Conservation Into Exhibit Planning, Design and Production*. (CD ROM). Division of Conservation, National Park Service: Harpers Ferry Center, 1999. (Accessed 2/14/06).
- ANSI/NISO Z39.79-2001. Environmental Conditions for Exhibiting Library and Archival Materials. Bethesda, MD: NISO Press.
- Norme Francaise, NF Z 40-010, June 2002. Prescriptions de conservation des documents graphiques et photographiques dans le cadre d'une exposition.

4. IFLA Brochure, http://www.ifla.org/VII/s18/pubs/GuidelinesExhibitionLoans.pdf.

5. Exhibition pitfalls are noted by the following in the bibliographic references, among others: ANSI/NISO, Conserv-o-grams, the Library and Archives of Canada, and NEDCC

6. The importance of having conservators involved at the beginning of the exhibit planning process is noted by the following:
- OGDEN, S. (ed.). 1994. *Preservation of Library and Archival Materials*. Andover, MA: Northeast Document Conservation Center, not paginated.

Occasionally exhibits are mandated with only three-month lead times, and this can be a problem when work plans, including those for preservation, are set years in advance and may not have resources readily available. The best scenario is that preservation and exhibits staff operate, as much as possible, according to 5-year plans – especially when commemorating predictable anniversaries or addressing collection themes that can be anticipated years in advance. An example of an appropriate 5-year checklist to ensure adequate protection for collections going on exhibit appears in Table I. The checklist tasks are assigned to conservation, curatorial and exhibition staff as appropriate, depending on the institution. In instances where exhibits are linked to unexpected donations and other events, the recommended 5-year checklist must be compressed. Consequently, sometimes it might be necessary to use facsimiles if there is not sufficient time, staff or other resources to protect collection items properly.[7]

SELECTING STABLE COLLECTION ITEMS

Only the most physically and chemically stable items should be selected for exhibition, and even then they should be displayed on a rotation basis (rather than permanently) in order to minimize risk of potential damage. To assess the overall chemical and physical stability of an item, items should be examined and their condition recorded on a condition survey form. Information useful in assessing condition to determine whether items can be stabilized for exhibition can be found in Table 2A. Items that are damaged (such as books attacked by mold or silverfish, or prints with folds or tape) may be treated and physically stabilized for exhibition if resources of time and expertise are available. But other items may be composed of materials inherently unstable chemically or physically (such as friable pastels or light-sensitive watercolors, photographs or inks). No treatment can completely stabilize these materials for display, and they require highly specialized environments, housing, mounts, and cases, if they can be exhibited at all. Generally, collection items can be categorized, based on sensitivity to light of media (such as certain inks, paints, etc.) that might fade and of substrates (linen paper or newsprint, vellum, etc.) that might bleach, darken or become brittle, as is indicated in Table 2B.

SETTING, CONTROLLING AND MONITORING ENVIRONMENT

The environment around items to be displayed includes macro- and micro-environments. Macro-environments are created by geographical location, buildings and rooms, while micro-environments are created by the housings, mounts and cases that effectively 'seal in' items on display. Collections need to be protected not only from dirt, but also from high levels of light, temperature, humidity and pollution, which can trigger oxidation and hydrolysis reactions that cause collections to fade, yellow or become embrittled. Cases should be

- PILETTE, R. 2000. Exhibition Policy and Preparation. IN: *Preservation: Issues and Planning, editors:* Paul Banks and Roberta Pilette, 185-205. Chicago; London: American Library Association.
- RAPHAEL, T. *Exhibit Conservation Guidelines: Incorporating Conservation Into Exhibit Planning, Design and Production*. (CD-ROM). Division of Conservation, National Park Service: Harpers Ferry Center, 1999. (Accessed 2/14/06).
- RAPHAEL, T. and BROOK, K. 2000. A Collaborative Effort to Create Exhibit Guideline: Resolving the Conflict between Museum Exhibition and Conservation *WAAC Newsletter*, 22(2). (Accessed 2/14/06).

7. OGDEN, op. cit.

filtered to eliminate harmful pollutants and fluorescent or daylight. They should also be monitored, and this can be done with non-recording or recording devices, which can be graphic displays or data loggers, such as the **P**reservation **E**nvironmental **M**onitor (PEM) developed by Image Permanence Institute.[8] As a general rule, items should be stored and displayed in low levels of light, temperature, humidity and pollution. Other considerations include low oxygen environments, fire suppression, and Integrated Pest Management.

1. Light

Light of any wavelength (ultraviolet, visible or infrared) can damage items through photo-oxidation (Table 3A). Light should be filtered to eliminate UV, and the intensity level of visible light should be controlled according to the sensitivity of the object displayed. Light is measured in lux or footcandles and a general recommendation is 30-100 lux for a six-month exhibit open ten hours/day. Light exposure is reciprocal, so depending on the total number of lux hours deemed safe, the time and exposure can be increased or decreased in equal ratios. Light meters should be used to measure light levels on various parts of items throughout a case. Fadometers can be used to measure the effect of light directly on objects to be exhibited.[9] Colorimeters can be used before and after an exhibition to measure changes in colors resulting from over-exposure to light. Blue wool standards can be included in cases to help alert staff to the presence of fade-inducing light levels and wavelengths.[10] Visitor-activated lighting is a good way to reduce the total number of lux hour exposures of items on exhibit.

2. Temperature and humidity

High temperatures can be generated by light (especially in the infrared region) or malfunctioning equipment in rooms or cases, and can cause desiccation from thermo-oxidation, leading to embrittlement, discoloration, cracking and curling. High humidity can also cause items to curl, as well as inks to run, and mold to grow. If the relative humidity is too low, some organic materials can become desiccated, leading to cracking and flaking of media or tearing of substrates. Humidity strips, sling psychrometers, and hygrothermographs can be used to measure or record temperature and RH, which should not fluctuate more that 5% over a 24 hour period.[11] To control temperature and relative humidity, cases can be conditioned using passive or active systems, set to be optimal depending on the type of material displayed (Table 3B). Passive systems require the use of conditioned silica gel, maintained to allow a relative humidity of 50% +/-5% at 21°C +/-2 (70°F+/- 5).[12] Active (or mechanical) systems require the installation and maintenance of dedicated HVAC sys-

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8. For more information on monitoring environments, see:
- WEINTRAUB, S., and WOLF, S.J. 1995a. Environmental Monitoring. IN: *Storage of Natural History Collections: A Preventive Conservation Approach*, editors, C.L. Rose, C.A. Hawks, and H.H. Genoways, 187-196. Pittsburgh, PA: Society for the Preservation of Natural History Collections.
- WEINTRAUB, S., WOLF, S.J., and RAPHAEL, T. 1995b. Macro- and Microenvironments. IN: *Storage of Natural History Collections: A Preventive Conservation Approach, editors*, C.L. Rose, C.A. Hawks, and H.H. Genoways, 123-134. Pittsburgh, PA: Society for the Preservation of Natural History Collections.

For the environmental monitors, see Image Permanence Institute Dew point calculator. (Accessed 2/14/06).

9. WHITMORE, P.M., PAN, X., and BAILIE,C. 1999. Predicting the Fading of Objects: Identification of Fugitive Colorants through Direct Nondestructive Lightfastness Measurements. *Journal of the American Institute for Conservation*, 38: 395-409.

10. COLBY, Karen M. 1992. A Suggested Exhibition Policy for Works of Art on Paper. *Journal of the IIC-CG* 17:3-17.

11. UNESCO: Safeguarding our documentary heritage. (Accessed 2/14/06).

12. Amounts of high performance silica gel recommended range from 5-20 kilograms per meter cubed for units with one air-exchange per day. See Weintraub, op.cit. p. 132

tems (regulating humidity, ventilation, and air-condition).[13] It's important to note that for every 10°F (18°C) increase in temperature, the rate of deterioration of organic materials doubles.[14] Temperature and relative humidity have an enormous impact on relative usable life of materials, as can be seen in Table 3C.[15] They also must be carefully calibrated to avoid crossing dew point, which lead to mold attack.[16]

3. Pollution

Pollutants increase the risk of oxidation and hydrolysis. Pollutants may come from:

a. outside air unfiltered for car exhausts or factories, etc. (e.g. nitrogen oxides, ozone, and sulfur dioxide);

b. inside air contaminated by inappropriate wood, carpets, paints, adhesives and other materials used for buildings, rooms, cases and housings (e.g. formaldehydes, acetic acid, formic acid and hydrogen sulfides); or

c. emissions of volatile acids from materials inherent in the actual item selected for display, such as acidic newsprint. Levels of sulfur dioxide, nitrogen dioxide, ozone, formaldehyde, acetic acid, and formic acid should be kept at 1-4 parts per billion after filtration (Table 3D). Filtration can be active (using pumps or fans to increase ventilation and air exchange) or passive (with sorbents such as activated charcoal, molecular sieves, or alumina impregnated with potassium permanganate). Air quality can be monitored using general corrosion monitors (such as metal coupons of lead, silver, zinc or other polished metal blanks, or Purafil Silver 6 Pak™, placed in an enclosed environment); direct reading devices (such as dosimeter badges, diffusion tubes, and detector tubes); or passive monitors such as indicator strips or techniques that require laboratory analysis (such as those used for formaldehyde, acetic acid, volatile organic compounds, or outdoor-generated pollutants).[17]

4. Low oxygen environments

Oxygen is the prime agent of deterioration for organic materials. For items of exceedingly high value and extraordinary sensitivity, encasement in an oxygen-free environment, where oxygen has been displaced by inert gases such as nitrogen or argon, may be appropriate. Such environments have the added advantage of having too little oxygen to allow ignition or sustain pests.

5. Fire suppression

No items should be displayed in environments lacking appropriate (and well-maintained and tested) fire suppression and fire alarm systems, since the consequences can be catastrophic.

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13. Dedicated HVAC systems can be expensive to install and maintain, and they may be prone to frequent breakdowns that can actually endanger objects by exposing them to high temperatures or humilities. For references on HVAC systems, see Weintraub, op. cit.

14. WEINTRAUB, op. cit. p. 123.

15. This information is derived from the Preservation Calculator developed by the Image Permanence Institute, and can be downloaded from the following website: http://www.imagepermanenceinstitute.org/sub_pages/8contents.htm

16. UNESCO, op.cit.

17. GRZYWACZ, C. Air Quality Monitoring. 1995, IN: *Storage of Natural History Collections: A Preventive Conservation Approach*, editors, C.L. Rose, C.A. Hawks, and H.H. Genoways, 197-209. Pittsburgh, PA: Society for the Preservation of Natural History Collections. p. 198 ff. A-D acid-base indicator paper strips, developed by IPI, can be used to determine acid levels caused by vinegar syndrome from off-gassing cellulose acetate materials.

6. Integrated Pest Management

Any institution housing and displaying library material should also have an Integrated Pest Management system of good housekeeping and detection to avoid incremental loss of collections. This means that food and drink should be avoided in actual exhibitions areas, even during openings.

Using Appropriate Housing, Mount and Case Design and Techniques

Only chemically and physically stable materials and techniques should be used to house, mount and encase objects. Examples of unacceptable materials are noted in Table 4A. **M**aterial **S**afety **D**ata **S**heets (MSDS) can provide information about materials considered for use, but often further testing is required to determine whether materials meet specifications and are safe to use in conjunction with collections.[18] Testing can take anywhere from 30 days to initiate quality assurance tests for housing, mount and case materials to two years for design of specially developed alarmed or argon treasure cases, so research, development and testing time must be factored into the five-year preservation plan for exhibits requiring such specialty cases.

1. Housings

Collection items should be protected in special housings, such as custom-made polyester film encapsulations, mats or boxes, as checked in Table 4B. It is most cost-efficient to select housing techniques for display that can also protect items during subsequent travel or storage (such as wrapper mats or cradles integrated into boxes). These housings can be hand-made, or produced using polyester welders (heat or ultrasonic), or automatic mat and box makers.

Items with non-friable media can be encapsulated using inert polyester film and double sticky tape, but this can cause problems if the item is displayed vertically, as it might slide into the tape, sticking to it and opening the seal. Encapsulated items that are acidic can benefit from the insertion of buffered backboards to absorb the volatile acids.

Items to be matted can be attached to backboards using polyester or paper photocorners, or hinged with Japanese paper and wheat starch paste. The backboards should extend beyond all edges of the item at least 5cm (2”). Vellum or parchment should be ‘string-matted’. Window mats can follow the contours of the items, or overlap slightly for safer handling. A wrapper can act as a cover when the item is not being displayed. Matboard should be buffered or acid-free (especially for blue colored items or albumen photographs that can change color in alkaline environments). Chemical woodpulp that is acid-free or buffered can make a fairly rigid mat.

Matted items are best handled as sealed ‘plexi-sandwiches’ or packages, with their glazing sealed (with an inert tape such as J-Lar or contact sheet such as Marvelseal 360®) to a moisture barrier backing. Acrylic glazing can be UV filtered, unbreakable acrylic sheets (such as Plexiglas® UF-3 or 4, Lucite UF-3, Perspex VE or other similar materials), polycarbonates (such as Lexan) or Amiran (‘shatterproof’) glass. Each has different properties of

18. DANIEL, V. Storage in low oxygen environments. 1995, IN: *Storage of Natural History Collections: A Preventive Conservation Approach*, editors, C.L. Rose, C.A. Hawks, and H.H. Genoways, 147-155. Pittsburgh, PA: Society for the Preservation of Natural History Collections. pp.146-151.

rigidity and permeability. Once sealed, these packages can be inserted into any frame (metal frames are preferred over wood, because of the acids that woods give off).[19]

2. Mounts

Lectern, folio, and other large bound volumes should be displayed horizontally (with their spines supported) rather than at any angle. Other bound materials should be mounted on custom-made or commercially available adjustable cradles of acrylic or acid-free board tailored to support opened books at whatever pages are selected for display. The cradles must be custom-fitted to support the spin and sides of the books. As a general rule, bindings shouldn't be held open more than 30-40 degrees (to prevent cracking of spines) and cradles shouldn't be angled more than 20 degrees (to prevent sagging and strain on the textblock). In most cases, the text block should be supported by raised pads on the lip of the cradle. If any pages are to be opened out and extend beyond the textblock (as in the case of foldout maps), the extensions must be supported as well. Polyester or polypropylene film strips can be used to gently strap the pages down.

3. Cases

Cases are generally described as 'open' or 'sealed', depending on how exposed they are to the ambient conditions of the room. Case construction should employ the most stable materials possible, such as fused powder-coated anodized aluminum or stainless steel.[20] If woods are used, they must be isolated with sealants or barrier materials. Visual storage cases are an excellent way to combine storage and exhibitions. These cases have a base system of drawers topped by a glass or Plexiglas® vitrine or 'object chamber'. The drawers themselves are covered with glass and have fiber optic lighting. These cases are an extremely practical way to economize on space while keeping collections together for display. They can be either passively or actively environmentally controlled for temperature and relative humidity (using techniques described in Section 3).

USING APPROPRIATE HANDLING AND SECURITY PROCEDURES

Handling items for exhibition requires clean hands and rigid supports to avoid undue physical or mechanical stress on the items (Table 5A). Books can be especially difficult, because specific handling considerations are based on the style of book, which can be bound in many ways with various cover materials (e.g. both hard and soft bound, with paper, vellum or leather, and side-stitched or oversewn, etc.). Each format requires special handling and

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19. For a comprehensive listing, see Library and Archives of Canada http://www.collectionscanada.ca/8/14/r14-206-e.html. Specifications, standards and tests can be found. The Getty Conservation Institute (GCI) "Research Webstracts" is an online listing of abstracts for ongoing research at the Getty Institute. American Society for Testing & Materials (ASTM)

Examples of tests relevant to exhibit conservation practices:
- Standard E741-95: Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution.
- Standard E779-99: Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
- Standard D6330-98: Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions.
- Standard G3-89: Standard Practice for Conventions Applicable to Electrochemical Measurements in Corrosion Testing.

20. NICHOLSON, Catherine. 1993. What Exhibits Can Do to Your Collection. *Restaurator* 13(3):95-113. pp.104-106

mounting. Guidelines for handling books encourage the user to consider whether the binding or paper are damaged, how well the book opens, and at what angle it needs to be supported to safely expose pages selected for display. General handling "do's and don'ts" can be found in Table 5B.

It should be remembered that exhibits usually display the most interesting collection items, which are consequently the most susceptible to theft, and in many cases may not be covered by insurance. The way to maximize security and minimize insurance costs (and deterioration) is to use facsimiles.[21] Visual (as well as written) records should be kept of the items before, during and after exhibition. During installations, one must be vigilant that items are not left unattended for any reason. This is especially a problem when fire alarms occur and premises must be evacuated. There should always be a cart or area where items can be stowed under lock and key in such emergencies. This is another good justification for the 'visual storage' type of case, since its drawers can be quickly locked.

The Library of Congress has a security plan that classifies objects in five categories (based on their value, rareness or vulnerability) as platinum, gold, silver, bronze, and copper.[22] The security plan includes preservation measures needed to control environment, emergency preparedness, storage and handling, needs assessments, physical treatment and reformatting throughout an object's various life cycles, which include exhibitions (as well as processing, storage, use, and transit).[23] An example of the requirements for the most valuable collections going on exhibit can be found in Table 5C.

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21. OGDEN, op.cit.

22. STRASSBERG, Richard. 2000. Library and Archives Security. IN: *Preservation: Issues and Planning*, editors: Paul Banks and Roberta Pilette, 166-184. Chicago; London: American Library Association.

23. DIZARD, R. Safe and Sound, Protecting the Collections of the Library of Congress. *LC INFORMATION BULLETIN*, June 1998, (Accessed 2/14/06).

Table 1

Coordination of time, staff, and resources for proper conservation and preparation of materials.

Table 2A

Examples of problems affecting items that should be treated before exhibition

Modified from: van der Reyden, D. 1995. Paper Documents. IN: *Storage of Natural History Collections: A Preventive Conservation Approach, editors*, C.L. Rose, C.A. Hawks, and H.H. Genoway, 327-353. Pittsburgh, PA: Society for the Preservation of Natural History Collections, Accessed 2/14/06.

Table 2B

Comparison of object sensitivity to light

Modified from: Colby, Karen M. 1992. A Suggested Exhibition Policy for Works of Art on Paper. *Journal of the IIC-CG* 17:3-17.

Table 3A

Summary of light damage to documents and recommendations for control

Modified from: van der Reyden, D. 1995. Paper Documents. IN: *Storage of Natural History Collections: A Preventive Conservation Approach, editors*, C.L. Rose, C.A. Hawks, and H.H. Genoway, 327-353. Pittsburgh, PA: Society for the Preservation of Natural History Collections. Accessed 2/14/06, with input from Andrew Robb, based on information from Colby, Karen M. 1992. A Suggested Exhibition Policy for Works of Art on Paper. *Journal of the IIC-CG* 17:3-17.

Table 3B

Optimum display temperatures and relative humidities

Modified from: NARA 1571, Archival Storage Standards, February 15, 2002, and UNESCO: Safeguarding our documentary heritage. Accessed 2/14/06.

Table 3C

Comparison of relative useable life expectancy

Modified from: Image Permanence Institute Dew point calculator. Accessed 2/14/06.

Table 3D

Parts per billion maximum permitted air pollution after filtration

Modified from: NARA 1571, Archival Storage Standards, February 15, 2002.

Table 4A

Unstable housing and case materials

Modified from: von Endt, D., Erhardt, W.D., and Hopwood, W.R. 1995. Evaluating Materials Used for Constructing Storage Cases. IN: *Storage of Natural History Collections: A Preventive Conservation Approach*, editors, C.L. Rose, C.A. Hawks, and H.H. Genoways, 269-282. Pittsburgh, PA: Society for the Preservation of Natural History Collections.

Table 4B

Preferred housing options

Modified from: van der Reyden, D. 1995. Paper Documents. IN: *Storage of Natural History Collections: A Preventive Conservation Approach, editors*, C.L. Rose, C.A. Hawks, and H.H. Genoway, 327-353. Pittsburgh, PA: Society for the Preservation of Natural History Collections. (Accessed 2/14/06) and van der Reyden, D. 2002. Housing and Environment Options for Display of Documents. http://www.si.edu/scmre/relact/displaydocs.htm, Accessed 2/14/06.)

Table 5A

Exhibition installation and dismantling recommendations

Modified from: van der Reyden, D. 1984, rev. 1999. Exhibition Installation and Dismantling.

http://www.si.edu/SCMRE/relact/docexhibition.htm. Accessed 2/14/06.

Table 5B

General handling preservation do's and don'ts

Modified from: van der Reyden, D. 2002. Handling Paper Artifact: Preservation Do's and Don'ts.
Accessed 2/14/06.

Table 5C

Collection security oversite committee platinum required action steps

Tables

Table 1

Coordination of time, staff, and resources for proper conservation and preparation of materials

4-5 years before opening
Preservation staff attend planning meetings with exhibition, public relations, curators and other key staff to be aware of exhibits planned 2-5 years out so that the following can be determined:
- when surveys of potential exhibit items need to be undertaken to determine condition;
- allotment of staff hours for the next 2-5 years to accommodate long-term exhibition plan;
- if there will be a need to shift time from backlog projects to exhibit projects;
- if sufficient staff expertise will be available, or whether a list of potential contractors should be developed and curriculum vitae cleared through human resource personnel;
- if sufficient supplies are anticipated to be on hand, with space to store them;
- if special mounts or cases will need to be developed and tested, and if contracts or funding are required;
- the state of the environment of facilities, rooms, and cases where collections will be exhibited or are stored, including transport vehicles, determined by monitoring through several annual seasonal changes;
- if UV filtering is required (and usually no more than 3-5 footcandles are allowed on exhibit.);
- what level of security is required, based on the insurance value of objects;
- if facility reports need to be dispatched.

3-4 years before opening
Ensure funding, personnel and supplies will be available.
Deploy facility reports forms.
Make adjustments to environments and continue to monitor.
Consult with curators and exhibit staff about items that might be selected for exhibits.
Develop condition report and recommendation forms.

2-3 years before opening
Review facilities report forms.
Begin condition report forms.
Engage any new conservators and assign to staff major treatments that would include, for instance, total rebinding of volumes and subsequent single leaf/folio treatments, backing removals, mending, filling, lining, inpainting, etc.
Develop and test any special case or mount techniques and materials to ensure they meet appropriate standards.
Develop travel housing for collections if necessary.

1-2 years before opening
Complete major treatments.
Assign and complete minor treatments, such as surface cleaning, flattening, mending, hinge removal, etc.
Complete final condition reports, photographs and other documentation.

9 months – 1 year before opening
Receive final Exhibition Object List from exhibition staff. The object list should be vetted by curatorial divisions and include appropriate identification information.
Exhibition Object List is reviewed by curator/custodial specialists and objects are approved or denied for exhibition and/or travel; insurance values are determined, as well as whether couriers should accompany the objects, depending on value assigned.
Determine whether conservators need to be present for installation and de-installation.
Conduct Conservation Review of all collection material included on the Exhibition Object List, to provide the following information for use by curatorial, conservation and exhibition staff:
– documentation of physical condition of collection material and conservation treatment needs;
– exhibition and storage housing needs;
– exhibition environmental specifications: light exposure and duration of wall time, temperature and relative humidity (ambient and microclimate);
– exhibition supports needed, such as cradles (determination of degree of opening and angle of display), mats, encapsulations and special housings (i.e. Plexiglas® packages, gasketed wall boxes, etc.).
- Make mats and cradles inhouse or through outside contractors.
- Exhibits conservator prepares data sheets that record all information determined at conservation/division review is for to exhibit's Registrar, who updates the Object List.
- Objects approved for exhibition are documented through either photography or scanning (If treatment is necessary, objects should be photographed/scanned after treatment. For in-house exhibits they are scanned for the library's website.)
- Assign and note an individual master control number to each object, penciled on the object or housing, to enable tracking the object's exhibit history.

2 months before opening
- Mount all exhibition material in exhibition housings. Assist exhibits staff with the installation of books in their cradles.

1 month before opening
- Condition exhibition cases with silica gel (for passive cases) and calibrate hygrothermographs in order to monitor room environments and exhibit case microenvironments.

TABLE 2A
EXAMPLES OF PROBLEMS AFFECTING ITEMS THAT SHOULD BE TREATED BEFORE EXHIBITION

PROBLEMS				SOLUTIONS (phased conservation approach)	
Type	**Appearance**	**Cause**	**Effect**	(should only be done by a technician,trainee, or conservator)	(should only be done by a conservator)
	localized; black, white or colorful; may have fluffy fungal surface growth	humidity (RH 60% or more); water damage; poor ventilation	staining; loss of sizing resulting in decreased strength & increased water sensitivity; contamination of collection	remove from collection; place in buffered folder or box; contact fumigation expert; control environment to reduce humidity & increase ventilation	away from collection, locally remove mold using a fine brush, micro vacuum, mask & gloves, decolorize if possible & appropriate; reinforce, mend, fill, and/or line weakened or lost support
Brittle	fractured, shattered, cracked or snapped paper or mount; may be yellowed	inherent acidity from groundwood pulp, alum rosin sizing, oxidation from light & heat, hydrolysis from moisture, & residual processing chemicals	no fold endurance; yellowed; could lead to loss of support	support paper or mount with insert, polyester film (if media not friable) enclosure or box of acid-absorbing (alkaline buffered) material	line paper or treat mount, support paper or mount with sink mount
Fragile	extensively torn and/ or creased	folding, mishandling, thin paper, acid ink	tearing could extend with handling, could lead to losses	support paper in folder or polyester film if media not friable	clean, mend, fill, & line
Rolled or folded	deformed, creased, cracked, ribbed or rippled	non-uniform compression or contraction; sidedness	non-uniform stretching or expansion; cockled	protect in box of adequate size	humidify, flatten, mend, line; store in oversize storage
Tacky adhesive	glossy, translucent, oozing	adhesive residue, tape	saturates color, yellows, transparentizes, stains, causes media to bleed or strike through	place in box, cover with non-stick material	remove tape & reduce adhesive with solvents
Stains	overall or localized yellowing or darkening	hydrolysis & oxidation (by high humidity, light, & volatile acids from housing & pollution); form light absorbing double bonds in cellulose polymer chain	yellowing edges from oxidation, darkening from acid materials	control environment to reduce humidity, light & pollution; protect items from acidity by rehousing with non-acid materials; loose surface grime may be gently brushed off	loose surface grime may be cleaned off with fine brush & eraser crumbs, decolorize with solvents & chemicals to increase legibility
	localized brown or other discoloration, often having a contour line	acid impurities embedded physically and/or chemically within the paper fiber	mat burn, slat burn, water stain, tape stains, adhesive stains	protect item from acid materials by rehousing; document tape stains	remove tape & stains by chemical & physical means; decolorize stains to increase legibility
Friable media	loose or smudged media	media has low binder content & only attached to paper fibers by physical embedding on surface	loss of information & detail; blurring of image	test for friability with a fine brush; place in box horizontally so that nothing touches the surface	consolidate if appropriate, custom house in a fitted box or wrapper sink mat
Cracked or flaky media	losses, cleaving, lifting media	desiccation of binder; abrasion; differential expansion & contraction of media & support; acidity of media	loss of information	place horizontally in box & reduce movement; contact a conservator	consolidate
Fugitive media	fading, lightening, change in contrast	decolorization of pigment of dye by light; pH sensitivity	loss of information	protect from light	no treatment possible, if pH sensitive, rehouse accordingly

TABLE 2B
COMPARISON OF OBJECT SENSITIVITY TO LIGHT

EXAMPLES OF INTERMEDIATE LIGHT SENSITIVE MEDIA (WHEN ON LINEN, RAG OR NON-ACIDIC PAPER), items that are generally stable enough to be displayed for a total of 200,000 lux hours annually, which is the equivalent of 6 months at 100 lux for about 10 hours a day, include the following media:

Graphic media Pencil, Chalk, Charcoal, Crayon, Graphite	**Ink (not friable)** India, Iron Gall	**Fine art and prints (without hand coloring)** Relief (Letter-Press, Wood Block) Or Intaglio (Drypoint, Engraving, Etching)	**Planographic prints** Lithograph, Photo-Mechanicals, Silk Screen, Stencil	**Colorants** Acrylic, Casein, Oil	**Photographs (without hand coloring and only earth pigments if colored):** Carbon prints, Cased photos, Gum Bichromates, Woodburytypes, B&W Silver Gelatin DOP Cibachrome	**News-Print** that has been deacidified	**Bound volumes** that are in good condition

EXAMPLES OF EXTREMELY LIGHT SENSITIVE MEDIA AND SUPPORTS, items that are not stable enough to be displayed more than a total of 100,000 lux hours annually, which is the equivalent of 6 months at 50 lux for about 10 hours a day:

Colored Pencil, Copy Pencils Crayon, Graphite, Pastel	Friable Ink, Ball Point, Bistre, Felt-Tip, Iron Gall, Sepia	Hand Colored Prints	Chromo-Lithograph, Silk Screen, Stencil, Ink jet prints	Water-Color, Japanese prints, Gouache, Tempera Day-Glo Pigments; Gamboges, madder, indigo, dayflower blue Safflower, lakes	Photo-Graphs w/hand coloring or non-earth pigments, Salted paper print, Albumen print, Platinotype, Palladium Print, Collodion POP, Gelatin POP, colored slides and prints, *cyanotypes, *peel-apart polaroids	News-Print, Blue -lined paper Colored paper	Bound Volume with blue-dyed cloth, Paste-papers, pamphlets

TABLE 3A
SUMMARY OF LIGHT DAMAGE TO DOCUMENTS AND RECOMMENDATIONS FOR CONTROL

Light damage to paper documents is caused primarily by ultraviolet (UV) radiation and visible light. Little damage is caused by infrared (IR) radiation other than in the form of heat.

UV radiation: damages by initiating photo-oxidation, which leads to:
- embrittlement resulting from chain scission and crosslinking of organic polymers in paper (fibers, size, additives);
- yellowing or darkening of chromophores from metallic or organic impurities (such as lignin, resin, starch, glue, etc.) from light absorbing double-bonds (leading to yellowing or darkening);
- decolorization or color shift of pigments and dyes as bonds are broken.

UV radiation can be controlled by the following actions:
- reduce UV 95-98% by filtration with UF 3 Plexiglas®;
- reduce the light intensity level;
- reduce the duration of exposure to the UV source.

Visible radiation: damages by photochemically induced oxidation, causing:
- discoloration (yellowing and/or darkening), as above;
- decolorization or color shift.

Visible radiation is controlled by reduction in:
- light intensity level;
- time of exposure to the light source. (Visible radiation damage is not controlled by filtration with UF 3 Plexiglas®.)

Infrared radiation: damages when it is absorbed because it is converted to heat, causing thermo-oxidation, which leads to:
- embrittlement,
- yellowing.

IR radiation is controlled by controlling:
- light intensity,
- distance from the source,
- increasing ventilation.

Recommendations for light levels and time of exposure vary according to the susceptibility of materials and are computed as lux/hours.

The susceptibility of the material can be categorized as follows: Intermediate Sensitive and Sensitive Intensity and length of exposure recommendations for various materials (assuming 1 footcandle = 10 lux, and 1 day = 10 hours).
- **Intermediate Sensitive**: media and substrate that contain light sensitive-impurities such as lignin, or are colored 100 lux/6 months = 200,000 lux-hours
- **Sensitive**: fugitive media; lignin-containing papers, colored papers 50 lux/6 months = 100,000 lux-hours

Lux-hour computations are reciprocal, i.e., an unstable paper document can be exposed at 500 lux for 1 hour or 50 lux for 10 hours and the effects are the same. The effect is also cumulative, i.e., "rest periods" do not rejuvenate a paper document; the damage is permanent and additive.

EXAMPLES OF INTENSITY AND EXPOSURE TIMES RECOMMENDED TO REACH A DETECTABLE CHANGE (Robb and Colby)	Light intensity lux	Exposure time in hours	Exposure time in months	Total lux/hrs per 6 month exhibition	Lifetime exposure in lux/hrs to detectable change	Number of times item can be exhibited 6 months before detectable change*
Just Noticeable Fade Limit	50	10	6 months	83,928	1,200,000	14
Sensitive						
Just noticeable fade limit intermediate	100	10	6 months	167,856	10,000,000	8

** This refers to the entire life of the item. It must be remembered that most items have been exposed to considerable light before coming into a library's collections, possibly already using up half their lifetime exposure or even exceeding it already.*

Table 3b
Optimum display temperatures and relative humidities

SUBSTRATES	Maximum Temperature (fluctuation +/- 2°C or +/- 5°F)	Relative Humidity (fluctuation +/- 5 % per 24h)
Parchment and leather	18 / 64	50-60
Papyrus	18/ 64	50-60
Paper	18/ 64	45-55 / 35-45
B&W negatives and photographs	<21/ 70	25-35 / 35-50
Colored negatives and photographs	<22/ 70	25-35 /35-50
Negatives on glass plate	<21/ 70	30-50 / 35-50
Cylinders	18 / 64	40 / 35
Mechanical discs	18 / 64	40/ 35
Magnetic tapes (audio and video)	18 / 64	30/ 35
CDs	20 / 68	40/ 35

Table 3c
Comparison of relative useable life expectancy (from the IPI preservation calculator)

T (°C)	T (°F)	%RH	Preservation Index (relative years)
20	68	50	44
20	68	45	50
20	68	35	66
15	60	50	87
15	60	45	90
15	60	35	115
10	50	50	158
10	50	45	182
10	50	35	244

TABLE 3D
PARTS PER BILLION MAXIMUM PERMITTED AIR POLLUTION AFTER FILTRATION

Sulfur dioxide	Nitrogen dioxide	Ozone	Formaldehyde	Acetic acid
1 ppb	2.6 ppb	2.0 ppb	4.0 ppb	4.0 ppb

TABLE 4A
INSTABLE HOUSING AND CASE MATERIALS

Acidic materials	Volatile acids	Oils	Formaldehydes	Other
Acid-curing silicones, sealants and adhesives Asbestos, sulphur, and lead-containing materials.	Vinyls, including, but not limited to, unstable chlorine-containing polymers (i.e. polyvinyl chloride, and Saran). Polyurethane-based products, including, but not limited to, paints, varnishes, and foams. Cellulose nitrate containing materials (i.e. lacquers and adhesives). Cellulose acetate-containing fabrics and films.	Oil-based paints or varnishes, modified alkyd paints.	Any material that emits formaldehyde (urea, phenol, resorvinol, formaldehyde), including, but not limited to, plywood, particle board, hardboard, and plastic laminates.	Silk Wool

TABLE 4B
PREFERRED HOUSING OPTIONS

Housing and mount materials and techniques		Pencil, chalk, charcoal, crayon, graphite, pastel	Ink (not friable) ball point, bistre, felt-tip, india, iron gall, sepia	Relief (letter-press,wood block) or intaglio (drypoint, engraving, etching) prints	Planographic print (lithograph, photo-mechanicals, silk screen, stencil)	Water-color, acrylic, casein, gouache, oil, and tempera	Photo-graph (silver gelatin, etc.	News-print	Bound volume
Polyester poly(ethylene terephthalate)	**Pockets**		X		X		X	X	
	L-Weld		X		X		X	X	
	Match bookwrap		X		X		X		
	Book jacket								X
	Book band								X
	Polyester book							X	X
	Polyethylene strips								X
Acid-free mat-board	**Window mat**	X	X	X	X	X	X		
	Window mat with wrapper	X	X	X	X	X			X
	Sling mat	X	X	X	X	X	X		
	Sink mat	X	X	X	X	X	X		
	Insert mat	X	X	X	X	X	X		
	Photo corners	X	X	X	X	X	X		
	Japanese tissue hinge (V or T)	X	X	X	X	X	X		
Cradle	**Paper plexi**								X
Horizontal box	**Clamp shell**	X	X	X	X	X	X		X

Note: all materials are acid-free or buffered; neutral is required for pH sensitive media; all techniques are non-adhesive except Japanese tissue hinging with purifed wheat starch paste.

TABLE 5A
EXHIBITION INSTALLATION AND DISMANTLING RECOMMENDATIONS

Installing: paper artifacts should be protected by folders or acid-free interleaving material when being moved. No item should be altered, cleaned or repaired without the written permission of the responsible party in conjunction with a conservator. Persons installing exhibits should have clean hands, and not wear jewelry that might snag or injure an item. A conservator should be contacted well in advance of the installation and dismantling dates for consultation. A conservator should be notified about all paper items expected to travel in order to ascertain possible risk to the artifact, determine treatment parameters, and develop suitable housing for travel with respect to its conservation needs.

Lighting: light levels should be checked throughout the case to insure that no area has excessive light. Paper items should never be exposed to heat exerted from a light source. Visitor activated light sources should be used wherever possible and practical.

Housing: all items should be properly housed before being loaned or transported to insure their safety during travel and subsequent handling. Rehousing by a borrower institution should be discouraged unless approved by a conservator in conjunction with the owner. When possible, items should also be properly housed before being submitted to exhibition personnel. When possible, display housing techniques should be appropriate for or adaptable to permanent storage housing in order to up-grade the security of the collection, protect the item during handling for display, eliminate the need to disassemble housing after an exhibit, and protect the item in storage. If possible, items should be housed in standardized units (up to 10 different sizes, for instance) in order to facilitate and economize on materials, space and ultimately storage, and to make calculations for design measurements easier and more accurate. Polyester film encapsulation should be used only for non-sensitive media such as photomechanical or lithographic prints with no hand-coloring or glazing, or manuscripts. In contact with friable media such as graphite, pastel, watercolor, gouache, etc., polyester film may cause ferrotyping (in high humidity), scratching (if not absolutely clean), or delamination (due to its static charge). A polywelder rather than double-sticky tape should be used to seal the encapsulation since items may slide into tape or the tape seal may give, according to techniques outlined by a conservator. When matting, add at least 2 - 5 cms (1-2 inches) all around the outside measurement to allow for safe handling once matted, and always cut the window to allow visibility of the platemark or border. Be aware that not all items are regular, and that one side might be different in measurement from another. For unusual or oversized paper pieces, ample space and time must be allotted to accommodate complicated mounting procedures. To affix items to mat backboards, only polyester film or acid-free paper corners, or Japanese tissue hinges with wheat starch, paste should be used. When possible, items framed or dust-sealed in a "passe-partout" technique with UF-3 Plexiglas® should remain so as this is the best housing currently available, and the expense in materials and time to frame and unframed the items may warrant rearrangement and even expansion of storage facilities if necessary. Paper items should be exhibited behind UF-3 Plexiglas® to protect the paper and media from light degradation. If the media is friable (i.e., pastel, charcoal, etc.) or the paper is thin or light-weight, glass should be used in place of Plexiglas® (which has a high static charge), and light levels should be kept low (30-50 lux) and monitored. Paper artifacts should be protected from dust and cleaning solutions, etc. either by an enclosed case or properly dust-sealed, moisture proof frame. Neither glass nor Plexiglas® should ever touch the surface of any paper artifact, book, pamphlet, etc.

Mounting: mounting for display should be sympathetic to the nature of the item: i.e. books and magazines should not be mounted vertically but should be supported by a slanted cradle to avoid strain and distortion of their bindings. Only 1 or 2 polyethylene straps should be used to secure open books, only when necessary, and then on only the outermost margins, loosely attached to avoid differential fading and tearing. (Polyethylene is recommended over polyester film for this since it is more flexible and less likely to tear the edge of a text block.) Framed items should be secured against a wall or platform or within a case to protect them from visitors and vibrations. They should not be suspended in open space, endangering the media. Clamps and brackets must be padded with non-abrasive, inert materials (i.e., acid-free matboard, plexi, etc.). Items should be mounted in ways that avoid physical stress or unbalanced weight distribution (i.e., books should not be forced open to a page which will crease or cause the spine to crack). Paper artifacts should not be held in place with tacks, staples, nails, etc. Nor should unapproved adhesives such as pressure sensitive tapes, linen tapes, or dabs of glue be used.

Encasing: measurements for housings and space needs should be calculated taking into account whether items are to remain in original housings (in which circumstance, the outside measurements of that housing should be noted). When measuring an item, note the size of its outermost edges, its platemark or border, and the actual image. Try to use a standard measuring devise to avoid slight discrepancies in measurement. Be aware that item size may change significantly after conservation treatments such as washing or flattening. Cases should not be placed near an outside door or window, in direct line of light from a window, under exposed pipes, over or near a heat source or an air conditioning unit. Items should be in contact only with acid-free materials. Nothing in the case or frame should emit volatile acids (i.e., adhesives, fabrics, paints, etc.). All materials should be tested and/or cleared by a conservator. Items should not be in contact with each other since some deterioration products can migrate from one item to another and since any overlapping, even without contact, can cause differential fading or discoloration. Items should never be in a partial shadow cast by another item, case edge, polyester strap, suspension chain, etc., as this too will cause differential fading.

Dismantling: a conservator should be consulted in advance concerning plans to dismantle so that problem pieces may be identified and monitored. Plenty of time should be allotted for dismantling so that items can be inspected, handled, and rehoused properly. Whenever possible, items well-housed should not be disassembled. Loaning institutions should be given an opportunity to accept their items back in proper housing if they so desire.

TABLE 5B GENERAL HANDLING PRESERVATION DO'S AND DON'TS	
Don't pull a book off a shelf by its headcap as this can cause damage.	Do pull a book from a shelf by pressing books on either side in or by pushing out from behind.
Don't rest books sideways on their foredges during transport or storage.	Do rest books that must go sideways on their spines
Don't photocopy damaged books on regular copy machines.	Do copy damaged books if necessary on customized copy machines and reduce access until the book is treated
Don't leather-dress books.	Do protect leather covers with polyester film book jackets or book bands.
ENVIRONMENT	
Don't allow friable materials like pastels to travel, or flaking or fugitive media to be displayed.	Do make facsimiles of sensitive materials, and use the facsimiles for display.
Don't allow documents to be exposed to volatile acids from wooden or freshly painted furniture, or pollution, from outside contaminants.	Do keep documents from physical and chemical contact with volatile materials by using only non-volatile materials, adhesives, cleaners, and furniture.
Don't laminate documents since the heat or solvent used can cause irreparable damage to documents.	Do encapsulate appropriate documents in inert, uncoated polyester film using ultrasonic or heat sealing.
Don't remove documents designated for cold storage from cold storage more than once a year, since each removal counters the gains made by cold storage (like removing food from a freezer!).	Do keep documents designated for cold storage in cold storage and use reformatted copies for general access and display.
Don't expose documents to unnecessary light, since this can cause fading and/or darkening;	Don't allow light to come close to documents since this can cause heat and curling.
Do control light intensity, proximity, and duration; keep documents in the dark or in folders and closed boxes or closed drawers. Don't place elbows or extraneous materials, such as labels or other documents on top of displayed items.	Do make sure to have plenty of space to use, examine, rehouse and display documents.
HOUSING	
Don't pressure-mount documents for display, or use improper glazing materials such as Plexiglas® for friable media or glass during traveling shows.	Do use spacers in framing and ultraviolet filtering glazing.
Don't use antistatic sprays on glazing that will come into contact documents since solvents continue to volatilize out.	Do clean glazing with deionized or distilled water and a small amount of alcohol if necessary, and wait 15 minutes until the surface is thoroughly dry.
Don't use interleaving materials inappropriately: interleaving can cause swelling of bookbindings; glassine is dimensionally unstable and loses strength upon aging; buffered tissues can cause color change in some blue pigments, in cyanotypes and albumen photographs.	Do use neutral tissue slip sheets or inert or uncoated polyester film under window mats for non-friable materials, and neutral or buffered insert paper behind encapsulated acidic documents.
Don't store photos or alkaline sensitive materials in buffered paper as this may cause color change.	Do use acid-free paper.
Don't over or under pack containers as this jeopardizes the structures of documents.	Do insert acid-free board supports or wedges (the full size of the documents) to take up excess space in boxes.
Don't use acidic enclosures, mats or containers such as kraft paper envelopes, or acid mats or wooden core solander boxes.	Do use acid-free, high alpha-cellulose enclosures, mats and boxes, either neutral or buffered, as appropriate to the type of document.

HANDLING	
Don't eat, drink or smoke where collections are stored, used or displayed since this will attract insects and lead to structural loss and staining.	Do keep areas clean to avoid attracting insects and rodents; keep liquids away to prevent spills and stains; keep hands clean to avoid stains.
Don't transport documents rolled under arms or without support as this may damage them.	Do support documents in folders, mats, boxes, etc., and on carts if necessary.
Don't carry more than you can safely manage to avoid accidents or strain on the documents or yourself.	Do get help if more than one person is required to move oversized or heavy material.
Don't work in cramped spaces.	Do dedicate surface space on which to work that is at least twice the size of the largest item, to allow it to be turned over safely.
Don't handle documents more than necessary since, this can tear and stain them.	Do use duplicates for sorting and selecting, and use originals for evidential value and material science research, etc.
Don't slide documents around on top of each other. documents to move or turn them over.	Do slide a support or folder under.
Don't grasp documents tightly by their edges.	Do hold documents lightly by diagonal corners if the corners are strong; move unsupported document by holding the document 'catty-cornered'.
Don't handle photographic materials with ungloved hands as finger oils can mar and degrade their surface.	Do wear gloves when handling photographic materials.
Don't use pens in collections as these can make irreversible unwanted stains.	Do use graphite pencils while working in collections.
Don't affix adhesive labels to documents.	Do use a #2 pencil if documents need to be marked for identification in a lower corner or on the reverse.
Don't trim documents or dispose of fragmented pieces.	Do keep pieces together; they can be aligned in approximate place if encapsulated using ultrasonic welding to spot weld polyester film.
Don't use any tape to repair tears and losses, since even 'archival quality' tape may have reversibility problems.	Do provide adequate support for brittle or fragile documents, reduce access to them and schedule them for repair using stable materials.
Don't fold documents to fit into mats, folders or boxes.	Do store documents in appropriately sized containers.

TABLE 5C
COLLECTION SECURITY OVERSITE COMMITTEE PLATINUM REQUIRED ACTION STEPS

1. Environment

- Develop specifications for temperature, relative humidity, pollutant and particulate levels, visible light, ultraviolet radiation, pest control and other environmental considerations.
- Regulate environment, so that it is controllable within tight tolerances required by especially sensitive materials.
- Monitor environment and record status continuously, with alarms to alert 24-hour staffed site to malfunctions.
- Review that monitoring and environmental systems are in good working order and maintained regularly.

2. Emergency preparedness

Ensure readiness for responding to collection threats, such as from water damage, fire, smoke, physical impact etc.

- Undertake readiness planning, making preparations for being able to respond effectively and efficiently to an emergency.
- Determine locations of priority collection materials, and emergency considerations for each area; resolve site vulnerabilities.
- Train staff in handling and/or recovery of damaged materials.
- Install effective systems to detect emergencies as early as possible to minimize loss and damage.
- Train staff in use of React Paks, emergency awareness, and emergency discovery response; train emergency personnel, such as fire fighters and police, in responding to site specific collection emergencies.

Install effective systems to detect emergencies as early as possible to minimize loss and damage.

- Place water, smoke and heat detection sensors, and/or cameras in strategic locations.
- Test and maintain detection systems, with annual inspections.

Install fire suppression systems that do not cause damage to objects when used (i.e. non-water methods).

- Develop new technologies in fire suppression and detection for improved response and minimization of collection damage.

Install notification systems, with call system or alarms to protective services.

- Develop 24-hour Collection Emergency Response Team.

Undertake recovery planning, making preparations to be able to execute efficient, effective response in an emergency, so that loss and damage to the collection is minimized.

- Implement communication systems using paper, walkie-talkie, phone communication systems for communicating during emergency and recovery.
- Secure recovery services from pre-contract preparation prior to major emergency to bring in outside contractors to provide necessary assistance.
- Plan for in-house recovery for on-site by preservation personnel to provide recovery services in response to a collection emergency.
- Stockpile in-house supplies and equipment, including React Paks, fans, appropriate clothing, blotters, dehumidifiers, and other equipment and supplies needed for emergency response.
- Develop recovery protocols through research and testing for new methodologies for emergency recovery of collection materials.
- Reserve funds for large-scale emergencies requiring special contracting assistance.

3. Storage

- Develop specifications for shelving, furniture and equipment that may affect collections through direct contact, physical impact, use, or other means.
- Undertake materials testing to determine whether selected materials meet specifications.
- Insure that furniture and equipment are customized for protection according to object needs, including cases for exhibition.
- Enact good housekeeping to insure that collection areas are kept free of dust, litter and other debris, with regular trash collection.
- Maintain furniture and equipment to keep it in safe and good working order.

4. Handling

- Develop specifications for photocopies, imaging equipment, exhibit supports, book trucks and other objects that come into contact with collections when handled.
- Train and educate staff and users in proper handling/storage practices.
- Supervise staff either through focused, intermittent supervision, in person or remotely.
- Enforce restrictions in use when necessary, e.g. that items can be handled only by authorized Library staff.
- Ensure appropriate and adequate workspace space to support Library materials.
- Secure supplies and equipment, such as white gloves, bolsters, cradles, edge copiers, proper book trucks, etc.

5. Needs assessment

- Review physical condition and curatorial priorities to determine priority selection for preservation action.
- Evaluate condition of individual items to determine physical stability and other issues affecting preservation, before and after display.

6. Physical treatment

- Develop materials specifications, through research and development, of criteria for the materials that may be used for physical treatment to support collection preservation.
- Test materials to determine whether potential selections meet specifications.
- Customize physical conservation treatment for individual or groups of collection items.
- Perform chemical analysis in concert with conservation treatment.
- Stabilize collections using preservation actions that minimize further change over time, including boxing, protective enclosures, minor repair.

7. Reformatting

- Create a facsimile or surrogate while keeping the original. A surrogate is a copy that will be served to users or displayed in lieu of the original, which is either too precious, too fragile or too much of a security risk to serve except in circumstances require use of the original. In most instances the copy is of preservation quality, which meets nationally recognized standards or guidelines.
- Develop reformatting methodologies, documenting best practices and/or standards to determine formats, techniques to prepare materials for reformatting, equipment, techniques to produce preservation quality product.
- Develop materials specifications, including requirements for media to which information will be copied.

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CONSERVATION ET EXPOSITIONS À LA BIBLIOTHÈQUE DU CONGRÈS

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Depuis la grande bibliothèque d'Alexandrie, la conservation, même si elle n'a pu être un rempart contre la catastrophe, joue un rôle majeur dans les bibliothèques. Aujourd'hui, nous pouvons numériser les collections, ce qui représente une mesure supplémentaire de sécurité puisque les données peuvent être photographiées et stockées sur différentes bases, même s'il faudra certainement plus de temps (et de nouvelles biotechnologies d'auto-reproduction) pour permettre que ces données restent accessibles. Mais préserver l'information, ou même l'aspect extérieur des livres, manuscrits, cartes, estampes et photographies sous forme numérique ou autre ne préserve pas les qualités intrinsèques de ces documents, c'est-à-dire la composition chimique des éléments originaux divers et variés, encres, pigments, colorants, papier, vélin et cuirs choisis par les auteurs, artistes et artisans. La composition chimique d'un document peut contribuer à authentifier les œuvres et renseigner l'étudiant, l'historien ou le scientifique consciencieux sur des détails d'ordre créatif et technique ou commercial, et sur d'autres interactions sociales. Les informations sont contenues dans l'original, en attendant de nouvelles technologies d'investigation qui nous révéleraient d'autres secrets grâce à la recherche sur les matériaux. Mais la composition chimique évolue. Tous les matériaux se détériorent avec le temps, en livrant moins d'informations, à plus forte raison lorsqu'ils sont utilisés ou exposés.

L'ironie de la chose, c'est que les bibliothèques dépendent de plus en plus de l'exposition de leurs collections, en ligne ou pas. L'exposition joue à présent un rôle plus important que jamais dans les bibliothèques, en tant que vecteur du savoir, loisir, plaisir pour les étudiants, le grand public et les donateurs. En même temps, elle incite à connaître, comprendre et conserver le patrimoine culturel. Les expositions célèbrent souvent des dons importants ou des anniversaires. Les conservateurs et bibliothécaires particulièrement attentifs sont heureux de ce rôle accru des expositions parce qu'ils y voient un autre moyen de promouvoir l'accès aux collections et la connaissance de ces collections. Malgré l'effrayante quantité de moyens nécessaires à une exposition (temps, personnel, matériaux, espace, fonds), conservateurs et bibliothécaires doivent être désireux decollaborer à ce travail pour le bien de l'institution et les progrès du savoir.

La Bibliothèque du Congrès possède aujourd'hui six galeries intérieures et autant d'emplacements extérieurs qui accueillent un grand nombre d'expositions chaque année. Des milliers de livres, manuscrits, cartes, bandes-dessinées, estampes, dessins et photographies sont exposés chaque année et des centaines nécessitent une attention particulière en matière de conservation.

Il existe de nombreuses sources d'informations élémentaires, publiées et en ligne, sur l'exposition des documents de bibliothèque, parmi lesquelles une brochure de l'IFLA intitulée « Directives sur les prêts aux expositions ». La Bibliothèque du Congrès suit même des règles strictes en matière d'exposition et a établi une commission des prêts qui se réunit une fois par mois. L'idée est largement répandue dans la documentation spécialisée et par les professionnels que l'organisation d'une exposition recèle des pièges qui peuvent mettre en danger les documents de bibliothèque.
Parmi ceux-ci, on compte :

1. **le manque de temps, de personnel et de ressources pour bien conserver et préparer les documents ;**

2. **le choix d'objets instables ;**
3. **l'exposition dans des conditions environnementales néfastes (lumière, humidité, température, pollution) ;**
4. **un montage et des vitrines inappropriés ;**
5. **une manipulation inappropriée et une sécurité insuffisante.**

Cette présentation soulignera les moyens d'éviter ces écueils en se concentrant sur :

1. **la façon d'organiser le temps, les équipes et les ressources pour bien conserver et préparer les documents ;**
2. **le choix de matériaux stables ;**
3. **le contrôle de l'environnement ;**
4. **un montage et l'utilisation de vitrines appropriés ;**
5. **une manipulation appropriée et une sécurité suffisante.**

EXPOSICIONES: EL PAPEL DE LA PRESERVACIÓN EN LAS EXPOSICIONES DE LA BIBLIOTECA DEL CONGRESO

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La preservación ha desempeñado un destacado papel en las bibliotecas desde los días de la gran biblioteca de Alejandría, pero incluso entonces no pudo salvarla de un desastre catastrófico. La capacidad actual de digitalizar las colecciones ofrece una medida de mayor seguridad, ya que el contenido informativo puede ser capturado y distribuido entre muchos depósitos, aunque la solución al problema del acceso permanente puede tardar muchos años más (y nuevas biotecnologías autorreplicantes). Sin embargo, la preservación de la información, o incluso la aparición de libros, manuscritos, mapas, estampas y fotografías en formato digital y otros formatos no preserva la evidencia inherente de estos materiales – es decir, la composición química de las vastas y variadas tintas, pigmentos, tintes, papel, vitela y pieles originales seleccionados por los autores, artistas o artesanos originales. Esta composición química puede ayudar a autenticar obras ya que aporta información al verdadero investigador, historiador o científico acerca de los avances creativos y técnicos, el comercio y otras interacciones sociales. La información inherente yace en el original, esperando a que las nuevas tecnologías forenses revelen más secretos mediante la ciencia de los materiales. No obstante, la composición química no es un estado fijo. Todos los materiales se degradan con el tiempo, revelando menos información, lo cual es más cierto aún cuando se usan o se colocan en exposición.

Irónicamente, las bibliotecas dependen cada vez más de la exposición de sus colecciones, tanto en línea como fuera de ella. Las exposiciones desempeñan actualmente un papel más importante que nunca en las bibliotecas como medio para educar, entretener y atraer a los investigadores, público general y donadores, así como para apoyar el conocimiento, la comprensión y la preservación del patrimonio cultural. Las exposiciones generalmente señalan donaciones o aniversarios importantes. Los conservadores y bibliotecarios cuidadosos reciben con agrado la mayor importancia que han

adquirido las exposiciones y consideran que son otro medio de promover el acceso y concientización acerca de las colecciones. A pesar de los inmensos recursos de tiempo, personal, materiales, espacio y financiamiento que se requieren para las exposiciones, los conservadores y los bibliotecarios debieran estar deseosos de colaborar en el proceso de las exposiciones por el bien de la institución y del avance del conocimiento.

La Biblioteca del Congreso cuenta ahora con media docena de galerías dentro de sus instalaciones, e igual número de sitios fuera de ellas que presentan exposiciones cada año. Miles de libros, manuscritos, caricaturas, estampas, dibujos y fotografías son exhibidos anualmente, y cientos de ellos requieren atención especial en preservación.

Existe mucha información básica acerca de la exposición de materiales bibliotecarios tanto en forma impresa como en la Internet, entre la que se incluye el folleto de la IFLA "Guidelines for Exhibition Loans" (Directrices de IFLA para préstamos a exposiciones). La Biblioteca del Congreso tiene incluso normativas especiales que rigen las exposiciones, además de un Comité para la Revisión de Políticas de Exposiciones (Exhibition Policy Review Committee) que se reúne mensualmente.

Se ha señalado ampliamente, tanto en la literatura como por parte de los profesionales, que las siguientes deficiencias de las exposiciones pueden poner en peligro los materiales bibliotecarios:

1. *falta de tiempo, personal y recursos para la adecuada conservación y preparación de los materiales;*
2. *selección de objetos inestables;*
3. *exposición a ambientes dañinos debido a factores como luz, humedad, temperatura y contaminación;*
4. *materiales de montaje y estuches inadecuados;*
5. *falta de manipulación y seguridad adecuadas.*

La finalidad de esta presentación es resumir las formas de evitar estas deficiencias, concentrándose en:

1. *coordinación del tiempo, personal y recursos para la adecuada conservación y preparación de los materiales;*
2. *selección de materiales estables;*
3. *control del medio ambiente;*
4. *empleo de monturas y estuches adecuados;*
5. *manipulación y seguridad adecuados.*

Session 3

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DIGITIZATION: SAFEGUARDING THE DIGITAL HERITAGE
NUMÉRISATION : CONSERVATION DU PATRIMOINE NUMÉRIQUE

Moderator: Helen Shenton
Preservation Collection Management
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* Ingeborg Verheul, Koninklijke Bibliotheek, The Netherlands
Networking for Digital Preservation: Current Practice in 15 National Libraries
Ensemble pour la conservation du numérique : les mesures en cours dans 15 Bibliothèques nationales

* Catherine Lupovici, Bibliothèque nationale de France
Conservation et accès aux ressources numériques à la Bibliothèque nationale de France
Preservation and Access to Digital Resources at The National Library of France

* Hilde van Wijngaarden, Koninklijke Bibliotheek, The Netherlands
Making (Preservation) Plans Together – Planning Strategies for Digital Preservation in The Netherlands and Europe
Pour une politique commune de conservation : établir des stratégies pour la conservation du numérique aux Pays-Bas et en Europe

* Laura Campbell, Library of Congress, USA
National Digital Information Infrastructure and Preservation Program:
What We Have Achieved So Far and Where We Are Headed ?
L'infrastructure nationale autour des contenus numériques et le programme de conservation : réalisations et objectifs

Discours de clôture
Agnès Saal, Directrice générale de la Bibliothèque nationale de France

NETWORKING FOR DIGITAL PRESERVATION: CURRENT PRACTICE IN 15 NATIONAL LIBRARIES

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THE CHALLENGE

Libraries all over the world have to deal with a fast growing number of digital materials that need to be safeguarded. Publications in digital form, online or on cd, digitised images, and born-digital objects need to be preserved for future access and use. Especially for national libraries, safeguarding the digital heritage is a major issue, because of their legal task to preserve the national heritage of a country.

ICABS

In 2003 six national libraries, including the Koninklijke Bibliotheek (KB), have taken up the initiative to form a new alliance under the umbrella of IFLA and CDNL, which was called ICABS (IFLA-CDNL **A**lliance on **B**ibliographic **S**tandards). ICABS focuses not only on the promotion of bibliographic standards but also on the international knowledge sharing in the field of digital preservation.

SURVEY

When planning digital preservation activities and improving cooperation in digital preservation, an overview of recent developments in the field of digital preservation issues could be a valuable aid.

Last year, the Koninklijke Bibliotheek, National Library of the Netherlands, conducted a survey for ICABS on best practices in digital preservation. This resulted in an overview of the current state of affairs in 15 libraries, addressing both operational and R&D activities aimed at digital preservation (baseline July 2005). The libraries involved in the survey were the national libraries of Australia, Austria, Canada, China, Denmark, France, Germany, Japan, the Netherlands, New Zealand, Portugal, Sweden, Switzerland, the United Kingdom and the United States of America.

The survey contains two parts: a general analysis and an in depth state of the art on digital preservation per library. It gives information on the following topics: the role of legal deposit legislation, the organisational embedding and the funding of digital preservation activities, the digital repository system in several aspects such as status, provided services, depositing, software and OAIS, materials, metadata and metadata schemes and access, developments on

preservation strategies and on current national and international projects. The survey results recently have been published, both online (http://www.ifla.org/VI/7/pub/IFLAPublication.No119.pdf) and as a publication in the IFLA Series.[1] At the same time, the National Library of Australia also carried out a survey for ICABS. This survey focused on the availability of guidances on digital preservation. Since this survey will only be available online, the KB-publication also contains a summary of the Australian survey.

Safely storing the digital heritage whilst still ensuring access for future use, requires libraries firstly to have a trusted digital repository system in place, and secondly to establish an ongoing R&D programme aimed at developing preservation strategies, such as migration and emulation. In this paper I would like to focus on these two aspects of digital preservation. What is the status of the digital repository systems? And what is their mission? What is the current practice regarding preservation strategies and what will be the future tendencies? Then I would like to discuss a topic that especially has my interest, and that is how both the operational and the R&D activities are embedded in the library organisations. I will end this paper with a general view on current international projects, that provide most promising networks for digital preservation in future.

Let us first look on the digital repository systems: what is their status, and what is considered their mission?

Status of the Digital Repositories

At present all of the national libraries surveyed already use repository systems for the storage and/or access of digital material they are producing in-house or receiving because of their deposit role. Libraries involved in web harvesting and web archiving have a storage and access system for these kinds of materials as well. These current systems usually consist of several separate systems that are connected. Most of these are not considered suitable for long-term storage and permanent access yet, and the libraries are currently planning to build an overall system which can meet these requirements.

Stages in Development

There are four stages in the development of a digital repository, which can be more or less overlapping: design, development, implementation and production. In the majority of cases, development and implementation happens in phases and per type of material.

In July 2005, which was the fixing date of my survey, two libraries had a digital preservation repository system in production. These are Australia and the Netherlands. Australia launched its DOSS for the storage of digital objects and PANDAS for the storage of websites in the PANDORA Archive in 2001. The Netherlands has had its e-Depot in production since 2003. Both libraries consider their systems operational, but state that a continuous R&D effort is needed to improve and broaden different aspects and tools, both now and in the future.

Eight libraries were in the development phase (Canada, China, Japan, New Zealand, Portugal, Sweden, Switzerland and USA) and five libraries were in the implementation

1. Ingeborg Verheul, *Networking for Digital Preservation: Current Practice in 15 National Libraries*. IFLA Series 119; München, KG Saur Verlag, 2006. 268 p., geill., ISBN 3598218478. € 78; IFLA-members: € 58.

phase (Austria - for the access part, Denmark, France, Germany and UK). Japan and France were in the process of accepting tenders for building the storage part of their digital repository and Switzerland for the ingest part. In 2010 ten of the 15 libraries surveys expect to have an operational digital repository in place.

THE MISSION OF THE DIGITAL REPOSITORY

All of the libraries involved are building their digital repository with the purpose of retaining the digital objects collected in perpetuity, in a structured, scalable and secure environment. This objective is translated in the central mission of the repository, namely, providing long-term preservation of and access to digital material. The importance of safeguarding the integrity of the digital object as part of the mission is an issue for all libraries involved in digital preservation.

TRUSTED REPOSITORIES

Four libraries state that their mission is also to serve as a repository for digital objects of other institutions, on a national or an international level (the Netherlands, New Zealand, Portugal, Germany). For this aspect the terms 'trusted repository' and 'third party repository' are also used. The international RLG/NARA Digital Repository Certification Task Force, is currently addressing the issue of trustworthy digital repositories. It is generally accepted that trustworthy digital repositories are fundamental to the international foundation of digital preservation. The Task Force is currently developing a certification process for assessing which repositories can be trusted with the responsibility of long-term preservation and permanent access. In 2005 the first guidelines were published, that can serve as a handbook and audit instrument. In 2006 the digital repository system of the KB will be one of the systems tested in accordance with these guidelines. Not only to test the system itself, but also to test the value of the Certification System.

The second aspect libraries need to focus on if they want to guarantee long-term preservation and access of their digital materials is to set up an ongoing R&D program. A few years ago, R&D for digital preservation mainly focused on archiving aspects, to date R&D seems to have made a shift to permanent access strategies.

CURRENT STRATEGIES

In general the libraries feel that there is no one single strategy to achieve long-term preservation and access for all different types of digital objects. The development of different strategies should be encouraged, together with research on evaluating strategies and methods for preservation planning. At the same time, all libraries state that the basis for long-term storage requires proper procedures for media refreshment and a good backup regime.

BIT-LEVEL PRESERVATION, NORMALIZATION AND CONVERSION

The most frequently used preservation strategy is preservation of the bits and bytes, or 'bit-level preservation'. This means providing secure storage, with proper procedures for backup and refreshment. Restrictions on submission (not accepting all formats) and normalisation

(conversion of formats into one acceptable format) are the second most used techniques, after secure storage. It is difficult for a library to influence the production-side of digital publication. Publishers choose their format, and libraries just have to accept what is deposited with them. However, there is a growing tendency towards promoting specific 'preferred' formats and publishers seem to be interested in cooperating. The standardization of technical metadata and how they are included are an important issue as well.

Increasingly attention is being paid to the quality of the digital objects deposited, and the development of risk identification and shared-representation information tools.

Migration and Emulation

Migration and emulation are considered to be the most promising preservation strategies to create permanent access to digital items. Migration or, format migration, is the translation of data from one (version of a) format to another. Emulation is the process of a software package mimicking a piece of hardware or software so that other processes think the original equipment or function is still available in its original form. Migration is aimed at the digital object itself. Emulation does not focus on the digital object itself, but on the environment with which the object is rendered.

Currently migration and emulation are only applied on a very small scale. This is due to several factors. Both strategies demand a considerable effort in both financial and technical terms. Practical tools to implement these preservation strategies have not been evaluated, developed or generally made available yet. Tools that do exist have not been developed for the specific purpose of long-term preservation, but were made, for example, for nostalgic reasons, such as rebuilding platforms for computer games. Therefore research is needed to assess both strategies with respect to their suitability for long-term preservation purposes. At present both France and the Netherlands have taken the first steps in developing tools for emulation.

Future R&D

In the years to come, Research and Development for digital preservation has to be directed towards developing test beds, tools for preservation planning and procedures, and tools for the invocation of solutions as well.

The majority of the libraries involved are not yet in the full operational phase of digital preservation and are therefore currently giving priority to the establishment of the digital repository and the mechanical processes of archiving and access. The moment the archiving systems are taken into production, the implementation of preservation strategies will become more relevant. At this time, all options are kept open. Future strategies are expected to be as flexible as possible, not precluding any future developments. They must also be affordable from both a technical and financial viewpoint.

The choice of the future strategy depends heavily on the development of the new infrastructure and policies within the library. Now let's have a look on how the digital preservation activities are embedded within the library organizations.

Policy Plans and Organizational Charts

Most of the current policy plans of the institutes surveyed, stress the importance of developing or expanding the scope of digital activities as a major issue over the next two to five years. When looking at the organizational charts of the libraries involved, this is also reflected in the fact that all 15 libraries have at least one department, unit or division that

refers to digital objects in some way. For three libraries the digital aspect is so important that they have a director of e-strategies amongst their board members (UK, New Zealand, the Netherlands). Three other libraries have an e-oriented division in the top level of their organizational structure (UK, New Zealand, Denmark). As digital preservation also involves routine library tasks (acquisition, cataloguing, collection care, IT), none of the libraries have placed all activities on digital preservation strictly within one unit.

POSITIONING DIGITAL ORIENTED

The position of the digital-oriented units in the libraries varies. They are positioned under collection-oriented divisions, process-oriented divisions, IT oriented divisions or strategy-oriented divisions. In many cases the libraries started with digital library projects or programs which focused on digitising materials for access. The preservation aspect of the digitised materials arose later almost as a matter of course.

CENTRALIZING AND MAKING RESPONSIBLE

Digital preservation influences all aspects of traditional library tasks. Therefore, a growing number of libraries is setting up a new working structure to ensure that the necessary measures can be implemented as smoothly as possible. They realize this by not only according digital preservation a central position within the organization, but also by determining who will take the main responsibility for the subject.

Eight libraries currently have one single department which bears the main responsibility. The choice of France, the UK and Canada for 'Collection Care' reflects their anticipation /expectation of a shifting or broadening perspective of the traditional preservation department's working area to include the care of digital objects. It is interesting to note the emerging role of preservation and conservation departments with regard to digital preservation. It stresses what the possible opportunities for exchanging existing knowledge on preservation strategies between paper preservation and digital preservation might provide for the preservation policy of a library in general.

COOPERATION WITHIN THE LIBRARIES

Central responsibility or not, digital preservation always implies cooperative activity between at least two or more units within the library. The status of the digital repository often seems to influence the number of units involved. In libraries focusing on the development and construction of the system, digital preservation activities often take place within one department. Libraries who are already working with a more or less operational system, have often split up the digital preservation activities into day-to-day workflow care activities and R&D activities. The KB is one of the few libraries with separate units that specifically focus on one of these specific tasks (e-Depot Unit for day-to-day workflow and Digital Preservation Department for R&D). Australia makes a distinction between conceptual R&D (responsibility of the Digital Preservation Unit) and implementation R&D (responsibility of IT). IT contributes to digital preservation in all libraries. In most cases it has the technical responsibility for the repository system, but it can also assume other roles, for instance overall coordination (Germany) or responsibility for day-to-day activities (alone or in cooperation with other departments.

Taking Care of Continuity

Several libraries have taken up initiatives to create cross-divisional working groups in order to secure a solid base for the future. These cross-divisional working groups focus on practical aspects of digital preservation or on strategic issues. In most cases these working groups are only temporary. There is however a tendency to form working groups for a longer-term (structural) basis. These working groups have to establish a continuous workflow, sustainable development and a firm embedding of digital preservation in the day-to-day activities of the library in the future, based on cooperation and sharing knowledge. The British Library has established such a group in 2005. In addition to these specific working groups, most libraries have an intensive consultative structure at all levels (meetings).

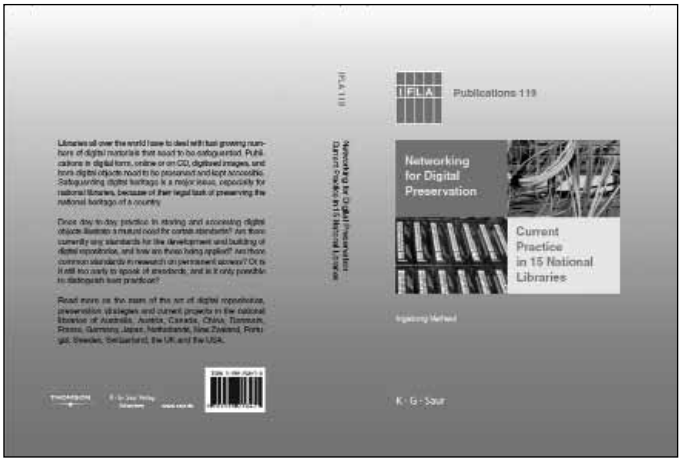
Staffing Levels

The number of staff currently involved in digital preservation activities is highly variable and fluctuating. Most libraries find it difficult to state how many people are actually working on digital preservation, because digital preservation activities also involve the activities of regular staff from other sections: acquisition, IT, digital content creating, cataloguing, web harvesting. Moreover, digital preservation is often part of a task, and not a full-time job. The number of staff active in digital preservation on a full-time basis varies from 3-15 full time equivalents. An exception to this are for instance the large library organizations in the USA and in Canada.

Networking

The title of this paper refers to the title of the book: "Networking for Digital Preservation". Networking refers on the one hand to the technical networks that underpin the digital repository systems within the libraries and on the other hand to the emerging (inter) national cooperative networks for R&D and knowledge dissemination.

Digital preservation is still under construction. Yet one thing is clear from all of the achievements to date: the promising future of networking is about to start today.



ENSEMBLE POUR LA CONSERVATION DU NUMÉRIQUE : LES MESURES EN COURS DANS 15 BIBLIOTHÈQUES NATIONALES

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Les bibliothèques du monde entier doivent gérer la sauvegarde d'un patrimoine numérique toujours plus important. Il est nécessaire de conserver et de rendre accessibles les documents publiés sous forme numérique, en ligne ou sur CD, les images numérisées et les objets nés numériques. La sauvegarde du patrimoine numérique est une question majeure pour les Bibliothèques nationales qui, grâce au dépôt légal, conservent le patrimoine national d'un pays. Stocker en toute sécurité le patrimoine numérique et en assurer l'accès pérenne nécessite que les bibliothèques disposent déjà d'un entrepôt numérique fiable et d'un programme Recherche et Développement en cours, axé sur le développement des stratégies de conservation comme la migration et l'émulation.

Lorsqu'on planifie des activités de conservation du numérique et qu'on souhaite améliorer la coopération dans ce domaine, une vue d'ensemble des évolutions récentes peut se révéler utile : est-ce que les pratiques quotidiennes de stockage des documents numériques et d'accès à ces documents sont les signes d'un besoin commun de certaines normes ? Existe-t-il actuellement des normes pour développer et construire des entrepôts numériques et comment ces normes sont-elles appliquées ? Existe-t-il des normes communes concernant la recherche sur l'accès pérenne ? Ou est-il trop tôt pour parler de normes et est-il seulement possible d'identifier des pratiques optimales ?

En 2004-2005, la Bibliothèque nationale des Pays-Bas a mené une étude pour l'IFLA-CDNL Alliance for Bibliographic Standards (ICABS) afin de trouver quelques réponses à ces questions. Cette étude se présente comme une vue d'ensemble de la situation actuelle dans 15 bibliothèques (à la date de juillet 2005), en abordant les activités à la fois sur le plan opérationnel et R&D. Les bibliothèques impliquées sont les Bibliothèques nationales suivantes : Australie, Autriche, Canada, Chine, Danemark, France, Allemagne, Japon, Pays-Bas, Nouvelle-Zélande, Portugal, Suède, Suisse, Royaume-Uni et Etats-Unis.

Cette communication présentera les résultats de cette étude, en faisant un point sur la situation de la conservation du numérique à travers le monde de façon à en proposer une vue d'ensemble. Les sujets abordés seront les suivants :

- **le rôle de la loi sur le dépôt légal ;**
- **l'organisation des activités en termes de conservation du numérique ;**
- **différents aspects du système d'entrepôt numérique ;**
- **les évolutions concernant les stratégies de conservation ;**
- **et quelques progrès majeurs en cours au niveau national et international.**

Creación de redes para la preservación digital: práctica actual en 15 bibliotecas nacionales

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Las bibliotecas en el mundo entero tienen que manejar un creciente número de materiales digitales que deben ser resguardados. Las publicaciones en forma digital, bien sea en línea o en CD, imágenes digitalizadas u objetos digitales originales deben preservarse y estar al acceso del público. En especial para las bibliotecas nacionales, la salvaguarda del patrimonio digital es un tema importante, ya que su mandato es preservar el patrimonio nacional de un país. El almacenamiento seguro del patrimonio digital y la garantía del acceso para un uso futuro exigen que las bibliotecas instalen un sistema de depósito digital confiable y que dispongan, además, de un programa permanente de investigación y desarrollo orientado a crear estrategias de preservación como la migración y la emulación.

Al momento de planificar las actividades de preservación digital y mejorar la cooperación en preservación digital, pudiera resultar de mucha ayuda hacer una revisión de los avances recientes en el campo de la preservación digital: ¿la práctica cotidiana de almacenamiento y acceso a los objetos digitales ilustran una necesidad mutua de ciertas normas? ¿Actualmente hay alguna norma para el desarrollo y construcción de depósitos digitales, y cómo se está aplicando? ¿Existen normas comunes para la investigación sobre el acceso permanente? ¿O todavía es muy pronto para hablar de normas y sólo es posible distinguir las mejores prácticas?

En 2004-2005, la Koninklijke Bibliotheek realizó una encuesta para la IFLA-CDNL Alliance for Bibliographic Standards (ICABS) cuyo objetivo era encontrar algunas respuestas a estas preguntas. La misma tuvo como resultado una revisión de la situación en 15 bibliotecas (fecha de referencia, julio de 2005), ocupándose tanto de las actividades operacionales como de investigación y desarrollo dirigidas a la preservación digital. Las bibliotecas involucradas son las bibliotecas nacionales de Australia, Austria, Canadá, China, Dinamarca, Francia, Alemania, Japón, los Países Bajos, Nueva Zelanda, Portugal, Suecia, Suiza, el Reino Unido y los Estados Unidos de América.

En este artículo se presentan los resultados de la encuesta, describiendo así una panorámica global del estado de cosas en lo que se refiere a la preservación digital en el mundo entero. Los temas tratados son:

- *el papel de la legislación sobre el depósito legal;*
- *el aspecto organizacional de las actividades de preservación digital;*
- *varios aspectos del sistema de depósito digital;*
- *avances en las estrategias de preservación;*
- *y algunos proyectos importantes actuales de carácter nacional e internacional.*

CONSERVATION ET ACCÈS AUX RESSOURCES NUMÉRIQUES À LA BIBLIOTHÈQUE NATIONALE DE FRANCE

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INTRODUCTION

La Bibliothèque nationale de France aborde une nouvelle phase de gestion de ses collections numériques qui ont déjà atteint fin 2005 une volumétrie d'environ 200 téraoctets. Ces collections hétérogènes sur le plan technique et sur le plan des procédures de conservation vont être intégrées dans un entrepôt global unique distinct du système de gestion de la bibliothèque. Lors de l'enquête réalisée par Ingeborg Verheul en 2004-2005 pour ICABS (**A**lliance for **B**ibliographic **S**tandards) de l'IFLA-CDNL,[1] qui est présenté dans cette session, la BnF venait de lancer son appel d'offres pour un système unique de stockage. Elle est maintenant en phase de conception du système complet pour gérer l'ensemble des fonctions d'un entrepôt numérique de conservation en conformité avec le modèle OAIS et la certification en cours de définition par RLG (**R**esearch **L**ibraries **G**roup) et la NARA (US **N**ational **A**rchives and **R**ecords **A**dministration). Le projet de quatre ans devra offrir l'ensemble des fonctions pour tous les types de collections.

LES COLLECTIONS NUMÉRIQUES DE LA BIBLIOTHÈQUE NATIONALE DE FRANCE

Les ressources numériques ont fait partie intégrante de la nouvelle bibliothèque dès la décision de sa création en 1988. La BnF a commencé dès 1992 à constituer ses collections numériques grâce à l'entrée en production de ses programmes de numérisation de masse, ainsi qu'à l'évolution de la législation sur le dépôt légal, qui a introduit la même année, l'obligation de dépôt pour les ressources électroniques sur support. Ce dépôt est devenu effectif début 1994 après la promulgation du décret d'application. Pour préparer l'ouverture des salles de lecture aux chercheurs en 1998, la BnF a commencé à acquérir des ressources électroniques, au départ essentiellement des bibliographies sur CD-ROM et des documents sonores, qui ont tous été mis à disposition des lecteurs par chargement dans des tours de CD-ROM ou dans des juke box. Les expérimentations conduites dès 1998 pour l'extension du dépôt légal des publications électroniques aux ressources en ligne ont ensuite permis de commencer à collecter et archiver des sites web de manière massive. C'est ainsi qu'on été réalisées en 2002, puis en 2004, les collectes de sites relatifs aux élections présidentielles, législatives et

1. Networking for Digital Preservation: current pratice in 15 National Libraries. – München : K.G. Saur, 2006. – 269 p. ISBN 3-598-21847-8 (IFLA publications; 119)

régionales. Aujourd'hui, la numérisation directe est en train de remplacer la reproduction analogique, non seulement pour communiquer les reproductions de substitution à la place des originaux, mais également pour les reproductions commerciales à la demande des utilisateurs. Dans le domaine de l'audiovisuel, la conservation et l'accès aux contenus analogiques passe impérativement par la numérisation. Enfin, le gouvernement français met en place l'administration électronique de manière accélérée et la BnF, qui a la responsabilité d'assurer le records management de ses archives courantes ainsi que la conservation et la communication de ses archives intermédiaires et définitives, a décidé de passer également au numérique pour ses archives administratives (création documentaire bureautique, messagerie électronique, gestion financière, bâtiment, gestion du personnel). La production documentaire administrative numérique est mise en place en 2006 avec la formation de l'ensemble du personnel à la gestion de bases de production documentaire utilisant l'outil Lotus Notes et s'appuyant sur une identification unique et un plan de classement global.

Toutes ces applications ont pris en compte dès le départ la problématique de la conservation des objets numériques, en fonction des avancées technologiques du moment de leur mise en place. La bibliothèque possédait fin 2005 près de 200 téraoctets de données produites, stockées, communiquées et conservées selon des procédures hétérogènes. Par exemple, le département de l'Audiovisuel a mis en place des procédures de rafraîchissement et de surveillance des supports et des procédures d'émulation de plateformes techniques obsolètes pour pouvoir assurer la communication en salle de lecture des premiers documents numériques sur support déposés par dépôt légal dès 1994. Les données collectées lors des expérimentations pour l'extension du dépôt légal aux contenus diffusés sur Internet n'ont quant à elles fait l'objet que de procédures de sauvegarde informatique, sans aucune action de conservation. La numérisation pour Gallica a opté initialement pour une migration des données lors de leur chargement sur les serveurs de communication et la réalisation de CD-ROMs en verre pour la conservation des masters de numérisation, mais ce procédé est aujourd'hui abandonné au profit de CD-ROM ordinaires, en attendant leur prise en charge dans un entrepôt numérique de conservation. Aucune des acquisitions onéreuses n'a fait jusqu'à présent l'objet d'actions de conservation. La production documentaire administrative doit intégrer au cours de 2006 la production de métadonnées de préservation lors de la création des documents. Elle ne fait l'objet pour l'instant que des sauvegardes informatiques ordinaires sans action particulière de conservation.

L'estimation prospective des volumes de données à conserver et communiquer à différentes communautés d'utilisateurs, exprimée en téraoctets et par type de collections numériques, est la suivante :

Type de collection	Formats de données	Année 2005	Année 2009	Année 2014
département de l'Audiovisuel				
Numérisation de sauvegarde	Défini par la BnF	96	400	460
Migration de CD et DVD	Standards industrie	50	280	
Dépôt légal nouveaux projets				
Presse quotidienne régionale	PDF	2	9	18
Archivage Web	Tous formats	80	400	800
Numérisation				
Communication (Internet intranet)	TIFF, JPEG	17	80	160
Reproduction commerciale	TIFF, JPEG, PDF	3	6	10
Reproduction de sauvegarde	TIFF	2	6	11
Acquisitions et archives administratives En cours d'instruction				
TOTAL en To		200	951	1739

Les formats des données numériques vont de formats maîtrisés et choisis par la bibliothèque, toutes les fois que les objets sont créés selon les spécifications de l'établissement ou que le format a pu être négocié contractuellement avec les producteurs, à des formats qui ne sont absolument pas maîtrisés pour les objets nés numériques acquis ou reçus en dépôt légal. Cette contrainte pèse fortement sur les fonctions de conservation des collections numériques et le système devra permettre de gérer l'obsolescence de tous les formats qui ont pu exister et qui sont présents en particulier dans les archives du Web.

Les volumes estimés recouvrent également des profils techniques très différents. Les collections audiovisuelles comprennent un nombre relativement peu important de fichiers très volumineux. A l'opposé, les archives du Web contiennent un nombre très élevé de très petits fichiers, par exemple les 30 premiers téraoctets de données des collections actuelles sont constitués d'environ 2,3 milliards de fichiers.

Les collections audiovisuelles et l'archive du Web constituent les volumes les plus importants de l'entrepôt numérique. Cependant, les volumes estimés pour la numérisation ont été calculés en fonction des pratiques actuelles de numérisation qui sont encore très proches de celles définies pour la reproduction analogique. Elles devraient évoluer vers des résolutions plus élevées, utiliser davantage les niveaux de gris et la couleur. Enfin, les volumes devraient augmenter de façon assez considérable lorsque la BnF aura lancé les opérations de numérisation de masse envisagées dans le cadre de la Bibliothèque numérique européenne. Le basculement des techniques de reproduction et de photographie vers le numérique est également en train de s'accélérer et progressivement, le numérique est accepté comme reproduction de sauvegarde et n'est plus systématiquement doublé par une reproduction analogique sur microfilm par exemple, en particulier pour la reproduction de sauvegarde en couleur.

LE PROJET DE SYSTÈME D'INFORMATION POUR LE NUMÉRIQUE (SI NUM)

La BnF est sensibilisée à la problématique de la conservation du numérique depuis 1998, notamment grâce à sa participation au projet européen NEDLIB (**NE**tworked **D**eposit **LIB**raries) qui était piloté par la Bibliothèque royale des Pays-Bas. Depuis la situation décrite dans l'étude comparative entre 15 bibliothèques nationales réalisée pour le programme ICABS par Ingeborg Verheul en 2004-2005, la Bibliothèque nationale de France a lancé au début de l'année 2006 la phase de conception du système global d'information pour la conservation et la communication de l'ensemble de ses données numériques. Le système devrait être développé et mis en place de 2007 à 2009. La méthode retenue par la BnF est dictée par la richesse et la diversité de ses collections qui sont déjà communiquées aux utilisateurs sur place et à distance et le système d'information pour la conservation et la communication devra d'entrée de jeu assurer l'ensemble des fonctionnalités définies dans la norme OAIS.

Ce projet de Système d'Information pour le NUMérique est un programme de développement de système aussi important pour la BnF que l'a été le Système d'Information défini pour la gestion des collections classiques et leur communication en salle de lecture et qui avait été lancé et réalisé en même temps que le nouveau bâtiment. Ce nouveau système qui devra être ouvert inter-opérera bien entendu avec le système de gestion informatisée de la bibliothèque mais ne lui sera pas assujetti.

Plusieurs actions de sensibilisation ont permis de conduire en 2004 les travaux préliminaires à la définition d'un système unique d'archivage, de conservation et de communication. C'est un programme de cinq ans qui a commencé en 2005 avec l'acquisition des premiers espaces de

stockage du futur système. Les actions de sensibilisation ont également été accompagnées d'une révision de la place et des objectifs de la numérisation dans la bibliothèque. La généralisation de l'utilisation du numérique et le basculement de l'ensemble des activités de reproduction vers le numérique se sont traduits par une révision des standards pour permettre la production et la conservation de masters numériques réalisés en numérisation directe qui devront pouvoir être utilisés dans tous les travaux de reproductions ultérieures ou de diffusion en ligne.

La réalisation du Système d'Information pour le NUMérique est programmée de 2006 à 2009, l'année 2006 constituant une phase initiale de conception qui devra synchroniser :

- la mise en place opérationnelle des premières tranches du système de stockage de masse ;
- le recueil des besoins et les spécifications fonctionnelles de l'application informatique de gestion de l'entrepôt numérique pour assurer la conservation sur le long terme et la communication des objets numériques ;
- la maintenance et l'évolution des applications existantes comme Gallica ou Mandragore (enluminures de manuscrits) pour assurer la continuité du service et préparer leur intégration dans le nouveau système global.

La démarche retenue pour la phase initiale 2006 de recueil des besoins des utilisateurs du système s'appuie sur le modèle fonctionnel du modèle de référence OAIS. Les utilisateurs du système seront largement associés à l'analyse des besoins. Ils valideront les fonctions et élaboreront les contrats de services que le système devra garantir.

- Les producteurs concernés sont les services d'entrées de la bibliothèque qui devront verser les documents dans le système et intégrer une étape de versement et de traitement des documents rejetés dans leurs procédures. Il est prévu de pouvoir abriter des dépôts et que l'entrepôt puisse rendre un service d'archivage de tiers de confiance pour le réseau des bibliothèques françaises partenaires de la BnF ou pour des éditeurs avec qui des contrats particuliers sont passés.

  En entrée, le système doit pouvoir accueillir toutes les collections et données administratives de la bibliothèque mais également d'autres bibliothèques partenaires ou de partenaires tels que les éditeurs. Le portail CAIRN <www.cairn.info> de publication de revues francophones en sciences humaines et sociales va tester l'utilisation du système de la BnF pour l'archivage pérenne des articles de toutes les revues publiées électroniquement sur ce portail. Il contribuera à la définition et à la validation des fonctions d'archives de confiance du système.
- Les fonctions de gestion administrative des biens stockés dans l'entrepôt et de gestion de la conservation seront définies et devraient permettre de créer une cellule d'administration de la gestion de la conservation de l'ensemble des biens numériques de la BnF, en complément des services classiques de la conservation et de la programmation des actions de conservation préventive pour les documents traditionnels.
- Les applications utilisatrices et les utilisateurs finaux devront également contribuer à la définition des fonctions d'accès aux ressources stockées dans l'entrepôt.

  En sortie, l'accès au système doit être possible pour la consultation à partir de fournisseurs de services d'information externes : moteurs de recherche, fournisseurs de services OAI, portails de bibliothèques numériques. Le système devra continuer à permettre par exemple la consultation de documents numérisés à partir d'une recherche effectuée sur le site Global Gateway de la Library of Congress dans le cadre de l'accord de partenariat « La France en Amérique ».

La phase initiale de recueil des besoins des utilisateurs du système produira des recommandations techniques sur les aspects suivants :

- choix du format de métadonnées permettant de gérer des objets complexes. METS a déjà été retenu pour la chaîne de numérisation et les échanges avec les prestataires extérieurs et a également été testé pour des archives thématiques du Web pour les élections françaises en 2002 et en 2004. Son adoption générale doit être validée ;
- formats pérennisables à utiliser pour la production de données numériques, évaluation des formats. Identification et inventaire des formats non maîtrisés figurant dans les collections ;
- système global d'identification pérenne. La BnF a retenu l'identifiant ARK (**A**rchival **R**esource **K**ey)[2] pour l'ensemble des catégories de ressources de l'entrepôt ;
- finalisation du sous-système de gestion des droits d'auteurs et droit voisin et des droits d'accès ;
- gestion des risques.

Les fonctions essentielles qui doivent impérativement être remplies sont :

- la garantie de la sécurité des données et de la qualité du service. Deux systèmes de stockage sécurisé distants sont mis en place et utilisent des procédures qualité ISO 9000 ;
- une fonction de gestion de la conservation ;
- un stockage supplémentaire pour les accès rapides pour toutes les collections offertes sans restriction d'accès sur Internet. Le système doit pouvoir intégrer l'augmentation des volumes de collections numériques attendue des actions pour une Bibliothèque numérique européenne qui pourrait représenter pour la BnF une multiplication par un facteur 10 de ses collections numériques en ligne, si les moyens sont dégagés.

La méthode de réalisation retenue par la BnF est un cycle de développement en spirale qui devra permettre d'ajuster la définition des besoins, après les tests utilisateurs et avant le déploiement du système. Cette méthode devrait permettre d'assurer au mieux l'acquisition progressive du système par les utilisateurs et de mieux gérer le changement en termes d'évolution des métiers et des formations nécessaires pour les personnels. La maîtrise du numérique doit se généraliser au sein de la bibliothèque et ne pas rester le domaine réservé de quelques experts regroupés dans des services spécialisés.

Le développement en spirale doit également permettre de mieux gérer l'aspect innovant complexe du système qui allie des fonctions d'archivage culturel et patrimonial pérenne, de records management et de service tout public sur Internet.

CONCLUSION

La BnF consacre en 2006 cinq années/homme de bibliothécaires et onze années/homme d'ingénieurs en informatique à la conduite de la phase de conception de ce système. Ce projet global pour un système d'information complet de conservation et de communication de tous les biens numériques de la BnF est un enjeu majeur pour conduire la gestion du changement vers l'intégration du numérique dans l'ensemble des collections et des services. Il doit emporter l'adhésion de l'ensemble de la bibliothèque et s'accompagner de l'évolution des métiers traditionnels au travers notamment d'actions de formation continue renforcées.

2. Archival Resource Key: what is ARK. http://www.cdlib.org/inside/diglib/ark (visité le 20 mars 2006)

L'approche globale qui a été retenue afin de bien prendre en compte toute l'étendue et la diversité des besoins, comporte un facteur technique de risque élevé. Il pourra s'avérer difficile de concilier des objectifs de conservation appliquant des procédures lourdes et complexes de qualité garantissant l'intégrité, l'authenticité et la sécurité des collections d'une part, et un système de communication très performant sur le Web pour la portion de collections dans le domaine public d'autre part.

Preservation and Access to Digital Resources at the National Library of France

Catherine Lupovici,
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From the early 90s, digital resources have been put together within several independent programs set up at the National Library of France. The digital heritage is already substantial and heterogeneous regarding access and preservation applications as well as access management (more particularly rights management). The BnF has been involved in Research & Development programs and international standardisation works on digital resources preservation. In 2005, the project for the implementation of the general information system devoted to digital resources management has been launched and will incorporate the existing applications. This program (2005-2009) should give the possibility to manage 2000 tera-bytes of data in 2012. It concerns analogical resources that should be digitised to provide online access to specific collections that need to be preserved (videos that were bought by the Audiovisual Department or received through the legal deposit legislation). The program concerns also the born-digital resources that were bought or received through the legal deposit legislation, including the collections that were put together in the context of web archiving operations. Eventually, since 2004, a software environment has been developing for office activities; as a result, current and permanent archives also need to be preserved and communicated electronically. In 2006, 16 employees work full-time on the program.

The information system should be both a repository for long-term preservation of patrimonial documents and a tool allowing fast communication of resources to which a great majority will have some unrestricted online access. The system should also provide records programs like publishers. All the applications of the future system have been determined according to the OAIS model and the system should be in adequacy with quality regulations that are being defined at the international level. The system will also need to be certified.

Conservación y acceso a los recursos digitales en la Biblioteca nacional de Francia

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La Biblioteca nacional de Francia comenzó desde principios de la década de los noventa a formar sus colecciones digitales, las cuales han sido tomadas en cuenta en varios programas independientes unos de otros. El ya considerable patrimonio digital es heterogéneo en cuanto a sus procedimientos de ingreso, conservación y gestión de acceso principalmente en lo que se refiere a la gestión de los derechos de autor y otros derechos similares. La Biblioteca nacional de Francia ha participado en proyectos de Investigación y Desarrollo y en trabajos de normalización internacionales relativos a la conservación de los documentos digitales e inició en 2005 la instalación de un sistema de información global de gestión de los recursos digitales que integrará las aplicaciones existentes. Este proyecto, que se realizará en el quinquenio 2005-2009, permitirá la gestión de 2000 teraoctetos de datos en 2012. Se ocupará de la digitalización de colecciones analógicas para dar acceso en línea, además de asegurar la conservación de ciertas colecciones como casetes VHS comprados o adquiridos por la vía de depósito legal para el departamento de materiales audiovisuales. Igualmente, se ocupará de las colecciones digitales originales adquiridas o recibidas por depósito legal, entre las que se incluyen las colecciones constituidas por las operaciones de archivo de la Web. Finalmente, ya que la biblioteca inició desde 2004 el paso a la administración electrónica, debe en lo sucesivo administrar la conservación y la comunicación de sus servicios corrientes y definitivos de manera electrónica. En 2006, el proyecto movilizará a 16 empleados tiempo completo equivalentes.

El sistema de información deberá unir las características de un depósito patrimonial de conservación a largo plazo y de comunicación rápida para los contenidos que se ofrecerán sin restricción en el mayor número posible en la Internet, sin olvidar las funciones de la gestión de registros y de archivo para las bibliotecas polos asociadas o los socios de la digitalización, tales como los editores. Todo el trabajo de especificación de las funciones del futuro sistema se basa en la norma OAIS. El sistema deberá cumplir con los parámetros de calidad que se están definiendo actualmente en el ámbito internacional, además de estar certificado.

Making (preservation) Plans Together

Planning Strategies for Digital Preservation in The Netherlands and Europe

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Three Aspects of Digital Preservation

Digital archiving requires knowing what it is you are preserving, how to store it and what to do to secure future viewing of the object. The last decade, a growing number of institutes have worked on finding answers to these three questions. This has resulted in publications, designs, models, standards and operational systems. The OAIS has been accepted worldwide as the basic model for setting up digital archiving, providing a common vocabulary that enables the digital preservation community to work together.(1)

The OAIS Reference Model

The OAIS consists of six entities:

- archival storage,
- ingest,
- access,
- administration,
- data management and
- preservation planning.

These six entities are all required when setting up a long-term archiving architecture. Recent developments have turned out many practical instantiations of archival storage, allowing structured ingest and access procedures. Administration and Data management were entities commonly in use for digital storage and had to be extended for long-term purposes. Even though this is still a new subject, a lot of progress has been made with "Premis", the preservation metadata model, as the most recent development. Preservation Planning however, is an entity in the OAIS model that can still be described as a black box. If that does not change, permanent access to stored digital objects is in danger (Fig. 1).

1. Consultative Committee for Space Data Systems (January 2002), *Reference Model for an Open Archival Information System* (OAIS), Blue Book, http://public.ccsds.org/publications/archive/650x0b1.pdf.

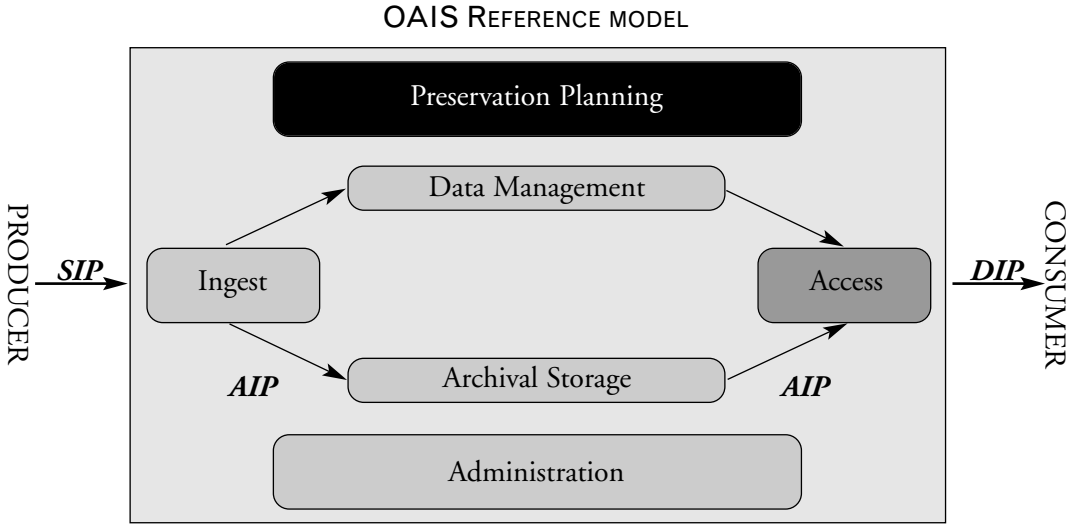

Fig. 1: representation of the OAIS model with Preservation Planning as a 'black box'

PRESERVATION PLANNING

In the OAIS reference model, Preservation Planning is described as the entity that "provides the services and functions (…) for providing recommendations to ensure that the information stored in the OAIS remains accessible (…)". Preservation Planning can only be implemented if there is input about other subjects. Firstly, the object characteristics have to be determined: what is the file format in which the object is stored, what are specific technical properties of the object itself and how can the file format be rendered, now and in the future. Secondly, the objectives of preservation of the responsible institution have to be taken into account. These can also be described as 'business rules': what is considered worth preserving and what is the designated community served by this institution? Finally, the available options are input for Preservation Planning: what technical options are available and what do they deliver? The 'ultimate goal' of taking Preservation Planning into practice is the development of decision models (possibly even automated). This way the execution of permanent access strategies, whether they are migration tools or emulation based solutions, can become an integrated part of the archiving infrastructure (Fig. 2).

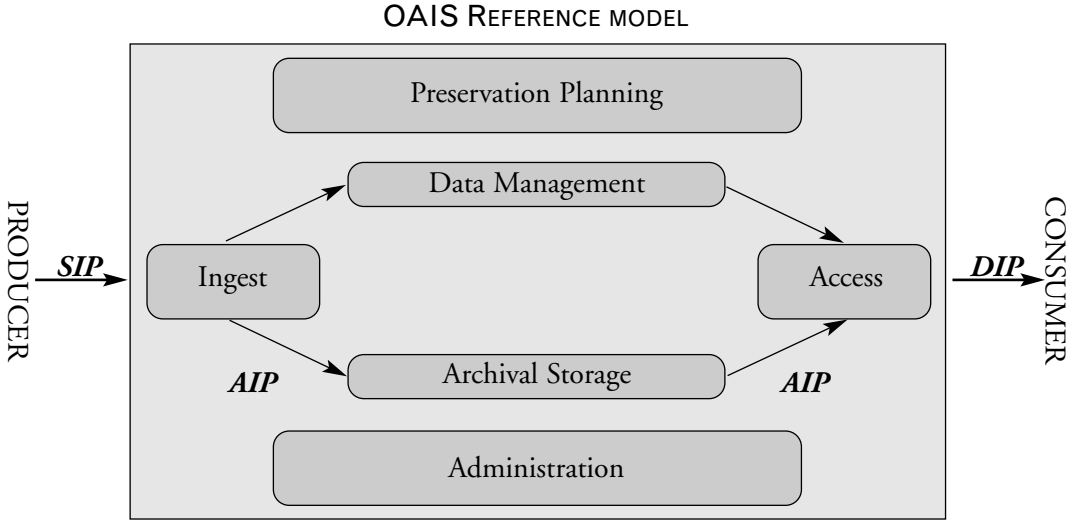

Fig. 2: representation of the OAIS model with all entities working

Digital Archiving at the KB: the e-Depot

The importance of working towards implementable solutions for Preservation Planning and permanent access is very eminent from the experience of maintaining an operational digital archive. At the KB, digital preservation has been an important topic for more than ten years now. This resulted in the development of the e-Depot, our digital archive for the storage and preservation of international e-journals. The e-Depot has been operational since the beginning of 2003 and automatically stores the digital articles of major international publishers like Elsevier, Kluwer Academic Publishers, BioMed Central, Blackwell, Taylor & Francis and Springer. Agreements have been signed that describe the deposit of e-journals to the e-Depot and the responsibility of the KB for keeping these articles accessible in the long-term. At this moment, the e-Depot contains five million e-publications and agreements have been signed for the deposit of another four million articles.[2]

The e-Depot consists of the IBM archiving system DIAS (**D**igital **I**nformation and **A**rchiving **S**ystem) which is integrated with other library modules. DIAS was developed by IBM in close cooperation with KB staff and is now a commercially available product. Last year, the German project KOPAL started using DIAS as well. The system includes batch ingest of electronic journals, e-books, and manual storage of CD-roms (installables). Batch delivery and automatic validation are in development, as well as storage and maintenance of preservation metadata. All publications are stored in the format in which they are delivered to us by the publishers, which is mostly PDF. All formats, excluding rare proprietory ones, are accepted.

Digital Preservation at the KB

The KB promises publishers to save their publications "as they are". We do not promise never to convert anything, but we will do our utmost to save the articles including their original functionality, if possible in their original format. However, this may be not what the future user wants, who will probably want to see an article in a format familiar to him. And he or she may want to browse through articles at one time, seeing them all in the same format, while they were in different formats originally. Before we can plan preservation strategies, we have to ask ourselves what we want to preserve and what we want to render.

Permanent access strategies can be divided into two categories: those that are aimed at changing the object itself (migration), and those aimed at changing the technical environment (emulation). At the KB, both strategies are subject of research and we hope to have practical solutions for both approaches to be implemented next year. Existing migration tools cannot simply be applied within an archiving environment, but have to be tested extensively so the best quality can be delivered. With emulation, existing tools are not available, as a preservation-based emulation approach does not exist yet. Because we believe emulation to be the only way to completely preserve the renderability of complex digital objects, we have started a project with the Dutch National Archives to develop an emulator.[3]

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2. OLTMANS, E. & LEMMEN, A. *The e-Depot at the National Library of the Netherlands*, In: Serials, Vol. 19 (1), March 2006, pp. 61-67, http://www.kb.nl/hrd/dd/dd_links_en_publicaties/publicaties/Serialsmarch2006.pdf.

3. VAN DER HOEVEN, J.R. & VAN WIJNGAARDEN, H.N., Modular emulation as a long-term preservation strategy for digital objects, International Web Archiving Workshop 2005, Vienna, Austria, http://www.iwaw.net/05/papers/iwaw05-hoeven.pdf.

Other approaches than emulation and migration probably exist, but are not worked out yet. And some approaches consist of a combination of emulation and migration, like the Universal Virtual Computer that IBM developed together with the KB.[4]

At the basis of integrating preservation strategies with our operational system, we have the Preservation Manager.[5] This application (soon to be integrated in the next version of DIAS) stores technical file format information and provides an opportunity to analyse this information and plan rendering strategies. Storing file format information is very labour-intensive but the KB will not have to do this alone. Initiatives have been started to work on a Global Digital Format Registry and the registry kept by the English National Archives (PRONOM) is accessible online.[6] In the future, interaction between the Preservation Manager and these international format registries will be facilitated.

The KB has now reached the point where research will have to lead to practical, implementable solutions. And we are not alone at this point: it is exactly where the other leading institutions in digital preservation are at this time. We share a sense of urgency and are fully aware that it is preservation planning that we have to work on now, to safeguard the permanent access to our stored digital cultural heritage and records of science.

"PLANETS"

It is exactly with this purpose that a group of European libraries, archives, research institutes and technology vendors have come together to submit a project proposal to the European Commission: "Planets". This name stands for: **P**reservation and **L**ong-term **A**ccess through **N**etworked **S**ervices.[7]

THE "PLANETS" PARTNERS

"Planets" is coordinated by the British Library and brings together a diverse but expert group of partners. Stakeholders in finding implementable solutions for preservation planning and permanent access are the National Archives of Great Britain, The Netherlands and Switzerland and the National Libraries of Austria, Denmark, Great Britain and The Netherlands. Research institutes are working on the problem from a more scientific point of view and will work together with the stakeholders on building solutions. Partners are the University of Cologne, University of Glasgow, University of Freiberg and Technical University of Vienna, which all have experience and expertise in the field. Last but not least, technology vendors have joined our group to build tools and the technical infrastructure that will allow us to set up work together in a networked environment. These technical partners are: the Austrian Research Center, IBM, Microsoft and Tessella. With the participation of these commercial partners the take-up and dissemination of research results is facilitated.

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4. VAN WIJNGAARDEN, H.N. and OLTMANS, E., *Digital Preservation and Permanent Access: The UVC for Images*, Proceedings of the Imaging Science & Technology Archiving Conference, San Antonio, USA, April 2004, http://www.kb.nl/hrd/dd/dd_links_en_publicaties/publicaties/uvc-ist.pdf.

5. OLTMANS, E., VAN DIESSEN, R.J. and VAN WIJNGAARDEN, H.N., *Preservation functionality in a digital archive*, Proceedings of the 4th ACM/IEEE-CS joint conference on Digital libraries, 2004.

6. Global Digital Format Registry: http://hul.harvard.edu/gdfr/,
PRONOM: http://www.nationalarchives.gov.uk/pronom/

7. Publications or a website on "Planets" are not yet available.

The "Planets" Project

The overall goal of the "Planets" project is to build planning services that empower organisations to define, evaluate, and execute preservation plans. As explained before, input is needed on other aspects of the problem, that will be developed as well. Methodologies, tools and services for characterisation of digital objects and innovative solutions for preservation actions provide the information and services which are needed in order to carry out Preservation Planning. An interoperability framework will seamlessly integrate the tools and services in a distributed service network. Everything will be tested in a testbed to provide a consistent and coherent evidence-base for the objective evaluation of different protocols, tools, services and complete preservation plans.

The "Planets" Workplan

All innovative research and experimenting within "Planets" is aimed at developing practical solutions and setting up the technical infrastructure that is needed to safeguard the European digital heritage. Because the group is formed around the leading European institutions in this field, "Planets" will integrate existing expertise, current developments and work-in-progress. The project will not be closed for other stakeholders and players in the digital preservation field but has been set up with an open structure. Usergroups will be set up that will be included in the testing process. Vendors of archiving systems will be organised to offer feedback and to test the implementation of the developed solutions. The "Planets" partners have been involved in earlier European projects like Nedlib and Erpanet, which secures continuity. They are also involved in current projects like Delos and the proposal to set up a European digital preservation network. Finally, experts from other parts of the world have been asked to be included in an advisory board, to set up close links with developments in the US and Australia.

The "Planets" Planning

The "Planets" proposal has been delivered to the European Commission for funding in the 6th Framework Programme, in September 2005. In December it was evaluated favourably and negotiations between the consortium and the European Commission are taking place at this moment. We hope to start the project in May or June of this year. It will be a four-year project, so it will run until 2010.

"Planets" in Practice

At the end of this paper, I want to return to the situation at my own library, the KB, again. Because it is often difficult to paint a clear picture of what it is that we are working on right now, let us imagine ourselves in 2010. A researcher, sitting at home behind his computer, requests a digital publication, published in 1999, originally stored in PDF 1.1. The viewer for PDF 1.1 does not exist anymore and a choice is offered to the user: he can either look at the article with the original viewer, running under emulation, or read the article as it is migrated to PDF 2.3, the current PDF version in 2010. It is not necessary to

come to the KB where the emulator is set-up, because emulation-based viewing is offered through browser functionality online. He can also be sure that the migrated version of the article is of maximum quality. Migration of this particular article was possible because a decision model produced the right tool for migrating PDF 1.1 (taking into account even more details, an article with flat text including four graphics and one picture) to PDF 2.3. This tool, exactly the right one for this specific request, did not have to be executed by the user, but was available to be plugged in in the KB storage environment which holds the specific article. Thanks to the "Planets" project, it is not just the e-Depot at KB that contains new functionalities, but these are ready for implementation at all dedicated institutions. This is the future scenario that "Planets" hopes to deliver.

POUR UNE POLITIQUE COMMUNE DE CONSERVATION
ETABLIR DES STRATÉGIES POUR LA CONSERVATION DU NUMÉRIQUE AUX PAYS-BAS ET EN EUROPE

Hilde van Wijngaarden,
Chef du Département de la conservation du numérique,
Division Recherche & Développement,
Bibliothèque nationale des Pays-Bas

Pour sauvegarder à long terme un objet numérique, il faut savoir quel est cet objet, comment le stocker et comment le rendre accessible. La description et le stockage de documents numériques ont fait l'objet d'une attention grandissante pendant ces dix dernières années, ce qui a conduit à développer des modèles de métadonnées et des systèmes d'archivage basés sur ces modèles. La mise en place de stratégies garantissant la représentation future des objets stockés suscite également de plus en plus d'intérêt. Elle s'accompagne d'essais qui incluent opérations de migration et d'émulation.

Aujourd'hui, la question principale concerne la programmation de stratégies de conservation à partir de l'information disponible. Il convient de savoir également comment automatiser ce processus de prise de décision. Des institutions comme la KB (Bibliothèque nationale des Pays-Bas) cherchent le moyen de mettre en œuvre les résultats de la recherche de façon coordonnée. Cela conduira à l'établissement d'une structure durable au sein de laquelle les principaux acteurs pourront travailler ensemble. Le projet européen « Planets » propose de rassembler des partenaires européens pour construire cette structure de conservation.

Cette communication présentera le projet « Planets ». Coordonné par la British Library, il a été soumis en septembre 2005 par un groupe européen de bibliothèques, d'archives, d'universités techniques et d'entreprises spécialisées dans les technologies de l'information. Le projet est en cours de discussion et débutera probablement à l'été 2006. Pour la KB, « Planets » représente une étape très importante vers ce qui nous permettra de mettre en place un système fonctionnel de conservation, non seulement pour notre propre système d'archivage, le e-dépot, mais de façon coordonnée, au sein d'une structure européenne.

Cómo hacer planes de preservación conjuntos

Planificación de estrategias para la preservación digital en los Países Bajos y Europa

Hilde van Wijngaarden,
Jefe del Departamento de Preservación digital,
División de Investigación y Desarrollo,
Biblioteca nacional de los Países Bajos

A fin de preservar un objeto digital durante un período prolongado, necesitamos saber qué tipo de objeto es, cómo almacenarlo y cómo recuperarlo. La descripción y el almacenamiento de los documentos digitales son temas que han recibido una atención creciente durante la última década, la cual se ha traducido en el creación de normas sobre metadatos y sistemas de archivo basados en esas normas. La aplicación de estrategias para la representación futura de los objetos digitales almacenados se ha convertido igualmente en un tema de interés, por lo que se están realizando pruebas de migración y se están preparando experimentos de emulación.

La pregunta más urgente en este momento es saber cómo se deben planificar las estrategias de preservación, tomando como base la información disponible. Además, es necesario determinar cómo podemos automatizar el proceso de la toma de decisión. Las instituciones como la KB (Biblioteca nacional de los Países Bajos) están buscando una forma de aplicar los resultados de la investigación de manera coordinada. Ello conduciría al establecimiento de un sistema sustentable en el que los participantes puedan trabajar juntos. "Planets" es la propuesta europea de un proyecto que reúna a los diversos socios de este continente a fin de construir una estructura para la preservación.

Este trabajo presenta el proyecto "Planets". La propuesta (coordinada por la Biblioteca británica) fue presentada en septiembre de 2005 por un grupo de bibliotecas europeas, archivos, universidades técnicas y empresas de tecnología de la información. Actualmente, se encuentra en proceso de negociación y es probable que se inicie este verano. Para la KB, "Planets" constituye un paso importante hacia adelante que nos permitirá llevar a la práctica la funcionalidad de la preservación, no sólo para nuestro sistema de archivo, el e-Depot, sino de manera coordinada dentro de un sistema europeo.

NATIONAL DIGITAL INFORMATION INFRASTRUCTURE AND PRESERVATION PROGRAM: WHAT WE HAVE ACHIEVED SO FAR AND WHERE WE ARE HEADED

(Web site: <www.digitalpreservation.gov)

Laura Campbell, Associate Librarian for Strategic Initiatives
and Chief Information Officer, Library of Congress, USA

The Library of Congress has long been a pioneer in the field of digital information. Even before there was broad public access to the Internet, we were digitizing rare and unique materials from our collections and making them available on CD-ROM to schools and libraries.

That pilot program ran from 1990 through 1994. We learned during this pilot that schools were using these materials and they wanted more of them. Fortunately, by 1994, the World Wide Web became widely available and we launched our National Digital Library Program. We now have more than 10.5 million items online that are being used by people across the United States and around the world.

By 2000, only six years later, we were talking about the need to preserve digital materials. We needed to preserve not only the digital materials on the Library of Congress servers but also the burgeoning amounts of digital information being created by other sources. Much of this information was 'born digital' – a term we weren't even using in 1994.

We realized that we needed to go back to Congress, which had generously funded our National Digital Library Program, and persuade them of the urgent need for a digital preservation program – to collect and preserve 'at risk' digital-only content.

Congress heard our plea and in December 2000 approved funding of $100 million for a **N**ational **D**igital **I**nformation **I**nfrastructure and **P**reservation **P**rogram (NDIIPP). Congress also stressed that the Library needed to work with many other groups in this nationwide program. As part of the legislation, Congress released $5 million to the Library to develop a strategic plan.

During most of the next two years, we held meetings with stakeholders across a broad spectrum of the private and public sectors – libraries, archives, museums, publishers, film and music distributors, copyright experts – to assess their concerns and to determine the 'state of the environment' for digital materials. We enlisted the help of information experts to look at several scenarios that would provide insight into the future and the role the Library should play in the future.

In October 2000, we issued our so-called 'master plan', formally called "Preserving Our Digital Heritage." The plan had to be submitted to five congressional oversight committees for approval before we could continue the program and before Congress would release additional funding.

Three months later, we received the approval to proceed and Congress released another $20 million. The remaining $75 million must be matched dollar-for-dollar from non-federal, in-kind or cash contributions.

The goal of NDIIPP is to:

- encourage shared responsibility among many institutions and organizations for the collection, storage and preservation of digital content;
- seek national solutions for the continuing collection, selection and organization of historically significant cultural materials regardless of evolving formats;
- ensure the long-term storage, preservation and authenticity of those collections and
- work toward persistent, rights-protected access for the public to the digital heritage of the American people.

This decentralized approach to building a digital preservation network recognizes one of the key findings contained in our master plan: that no single institution, not even one as large as the Library of Congress, can do this work alone. It takes a network of committed partners. Therefore, our strategy is to 'seed' the network, to develop the technical infrastructure to support the partners and to develop and test new business models and services needed by the network.

We are thus initiating actions that are:

- catalytic,
- collaborative,
- iterative and
- strategic.

The digital preservation program has three major areas of investment:

First

Identifying partners who agree to collect and preserve specific types of digital content that is important for the national collections. These are practical applications in which we are learning by doing, including seeking new business models for preservation work.

In September 2004 we awarded nearly $14 million to eight consortia comprising 36 institutions nationwide. These institutions agreed to collect and preserve content such as political Web sites, the history of the dot.com era, geospatial information, digital public television programs, social science datasets and Southern cultural materials. The institutions were required to provide in-kind matching funds. Approximately 70% of NDIIPP funding will go into these types of content-based projects. We are modeling and testing sustainable approaches for a decentralized and distributed network of partners.

Second

Developing a technical architecture, investing 20% of our resources in developing the architecture necessary to support these partners. Several investments in this area include our Archive Ingest and Handling Test, which we conducted with four universities; our work with Los Alamos National Laboratory; our partnership with the San Diego Supercomputer Center; and the recent award we made to Portico. Let me tell you about these investments.

We have just completed a joint project with four universities to explore strategies for the

ingest and exchange of digital archives. The Archive Ingest and Handling Test identified, documented and disseminated working methods for transferring and preserving a large archives among several institutions. Four different existing architectures were tested. These included Fedora, DSpace and digital repositories at Stanford and Harvard. The test focused on ingesting, exporting and transferring a multi-media archives withover 25 different file types. A broad array of current open-source and proprietary digital-object management and preservation technologies were deployed in the test. This work informs the next investments in building out the architecture. The final report is available on our Web site.

In November 2004, the Los Alamos National Laboratory's Research Library was awarded a grant from the Library of Congress to support research and development of tools that will help address complex problems related to collecting, storing and accessing digital materials.

The first phase of the project is nearing its successful completion, that of testing tools for the transfer and archiving of complex digital objects. The goal is to adapt existing standards for transferring content between repositories and to use other standards for digital object storage. The mechanisms and tools developed in this phase are being tested on digital journal materials of the American Physical Society.

The Library is engaged in a test of remote storage and content management with the San Diego Supercomputer Center. The goals of the project are for the Library to gain experience with managing and preserving content in a distributed architecture as well as to learn more about the aspects of agreements needed for third-party preservation storage arrangements.

Last October, we announced a $3 million grant award for the development of Portico, a nonprofit electronic archiving service specifically focused on the preservation of scholarly electronic journals.

Portico's business model has the potential for broad applications. In many ways, Portico is facing on a smaller scale some of the same issues as NDIIPP, for example, how to balance the rights and needs of the content owners and those who use it and, how to pay for the content's preservation.

Portico encourages electronic journal publishers to provide digital copies of their materials as a kind of insurance – if for some reason, the publisher's version of the journal were to become lost and irretrievable. Portico has been able to successfully persuade journal publishers that their participation will not reduce their potential revenues and that partnering with Portico will reduce their internal archival work.

For libraries, perpetual access to journals is an incentive to join Portico. Publishers annually pay from 5 to 10% total journal revenue for Portico's services, and libraries pay $1,500 to $24,000, depending on a library's total materials expenditure.

The award to Portico advances two fundamental goals of NDIIPP: to develop a technical infrastructure to support long-term preservation of digital content and to foster the development of new business models for digital preservation services.

Third

Basic digital preservation research; for example, in May 2005, together with the National Science Foundation, which has been working with us from the beginning, we awarded $3 million to 10 university teams to undertake pioneering research to support the long-term

management of digital information. These awards are the outcome of a partnership between the two agencies to develop the first digital-preservation research grants program. These grants will be used to explore challenging topics, such as preserving rich oceanographic data from hundreds of deep-sea submersible missions; automating methods to describe digital objects and place them in secure archival storage; testing how to preserve digital video when it is first created; and preserving complex three-dimensional digital content. All the projects are expected to produce study results in one year.

In addition to these three investment areas, the Library of Congress has formed an independent working group designed to examine the portion of the U.S. copyright law that deals with preservation. We have learned that we must resolve some of the intellectual property issues that hinder our work in order to move forward with the digital preservation program.

The Library is in a unique position because the U.S. Copyright Office is part of the institution. The newly formed working group, known as the Section 108 Study Group, convened in April 2005 under the sponsorship of the NDIIPP and the U.S. Copyright Office to re-examine the exceptions and limitations applicable to libraries and archives under the Copyright Act, specifically in light of the changes produced by the widespread use of digital technologies since the last significant study in 1988. The group will make recommendations this summer for changes that result in draft legislation for Congress, addressing exceptions for libraries and archives to collect, preserve and serve digital materials.

In just five years, we have learned a great deal about the relatively new field of digital preservation.

We have learned an enormous amount from our original eight content-collecting partners.

The partners meet as a whole group twice yearly, and smaller working groups meet monthly, focusing on four cross-cutting areas:

- selection and collection of digital content,
- intellectual property issues,
- development of a secure technical architecture and
- economic sustainability of the digital preservation work that they are now engaged in.

The NDIIPP initiatives funded thus far have provided us with good information to prepare for our next investments. We have learned that partnerships need an infrastructure that supports preservation strategy testing. Content exchange has proven to be one of the most useful tests for institutions to assess their own preservation assumptions. Partners have demonstrated expertise and achieved results that promise to become services and products for the network. The research investments have proven to be directly relevant to the practical tests and projects.

There is now a deep concern among public institutions about the proper care of digital information. Collecting institutions are also interested in the development of practical models for digital preservation, given the fact that their resources are limited.

We know that it's not just libraries and archives that are struggling with these issues. The American states and their various agencies are also weighed down by mountains of state information being produced in digital form for which no one is taking long-term responsibility. We learned from three workshops we conducted this past spring with representatives from all the U.S. states that there is little if any funding for digital preservation in most states, and it is only archival institutions that are really concerned with keeping their

information safe and available. State and local courts, for example, are often producing digital materials with no mechanisms to ensure their availability for future generations.
We also have learned that there are expectations for the Library to be a catalyst and coordinator for various digital preservation efforts, without asserting 'top-down' ownership.

If there is anything positive to the tragedy wrought by Hurricane Katrina it is that it has heightened the public's awareness of preservation's importance. In addition, stories in the media about identity theft and data loss, such as the vanishing collections of personal digital photo collections and the deterioration of compact discs and DVDs, have only added to growing worries among the public that digital information is neither secure nor safe from those who should not have access to it.

The issue of what 'stewardship' means in a digital environment encompasses much of our discussions. Stewardship can be represented by looking back upon all that has been achieved and also by anticipating and thinking strategically about the future.

Who will pay for digital preservation is not clear, and it is of paramount concern to all our partners. There is much educational work to be done. The case for digital preservation's importance must first be made with the general public – and then public officials in order to make this work a governmental priority.
Perhaps one of the most important things we have learned is that we all must share the workload and that we are not going to define one system for everyone. The best we can hope for is that, whatever preservation means are used, they are interoperable and compatible. One size system will not fit all.
We have much to learn about how to share this responsibility, and it will require a transformation about how we do our work.

In 2006, NDIIPP is preparing to make a new set of investments in areas to strengthen the initial network and encourage participation in areas we have not explored as much as we would like.
For example, we are planning on working directly with content creators in the private sector. We need to capture and preserve more of this material and we need to instill among private sector creators and distributors an awareness and appreciation for digital preservation. It is imperative that they see the economic value in preserving their digital works. In the analog world, most preservation was left up to libraries and archives, and they could wait decades or more before preserving, say, a deteriorating book or manuscript.

We will work with producers of music, film, and digital images, among others, to develop standards and metadata approaches that can be incorporated into their work to assure their preservation. This will be especially critical as electronic deposit of materials with the U.S. Copyright Office becomes the standard way of doing business.

We all know that in the digital world, decisions about preservation need to be made at the moment of creation, or we risk alteration or loss of the content. Many producers of commercial content are not focused on long-term preservation and have not been made sufficiently aware that they themselves need to make decisions about the preservation of their content.

NDIIPP is also planning on making awards to the U.S. states to jump-start their digital preservation initiatives. We are currently seeking proposals from the states for the development of model technical infrastructures for the collection and preservation of information

especially of interest to state and national legislators and other policymakers. Because it is not possible to fund every state individually, we hope these state investments will spur collaboration within the states and among the states.
We will make further investments in our existing partners in areas that strengthen core services and technical solutions for the network as a whole. A special emphasis is on integrating the work among the three major areas of investment. For example, tools for ingesting and describing content and services for large scale storage.
We will also make additional awards in the area of research. By working again with the National Science Foundation, we will make awards of between $5 million and $10 million during 2006. These awards will directly address the needs of the partners in the network.

All of these new projects will enable NDIIPP to build on what we have already learned as we head toward 2010, when we make recommendations to Congress about the long-term sustainability of the national digital preservation program. We will report to Congress on the results of our investments and offer our recommendations for moving forward. Our work will not be finished at this point. Far from it. We will recommend options for strengthening and funding an ongoing national network of partners.

Collaboration will be the key to our success. In addition to our partners domestically, the Library of Congress became one of the founding members of the International Internet Preservation Consortium (IIPC). We have teamed with the National Libraries of Australia, Canada, Denmark, Finland, France, Iceland, Italy, Norway, Sweden, the British Library and the Internet Archive (USA) in this consortium contribute to the development of shared tools and technologies for preserving web sites. Together, we can make a difference that is far greater than the sum of our individual efforts.

L'INFRASTRUCTURE NATIONALE AUTOUR DES CONTENUS NUMÉRIQUES ET LE PROGRAMME DE CONSERVATION

Laura Campbell, Conservateur,
Adjoint pour les initiatives stratégiques
et Directeur des services d'information,
Bibliothèque du Congrès, Etats-Unis

A la demande du Congrès, la Bibliothèque du Congrès a engagé un programme national pour la conservation du numérique intitulé « Infrastructure nationale autour des contenus numériques et programme de conservation » (NDIIPP), en collaboration avec d'autres structures fédérales et non fédérales. Les buts du programme sont les suivants :

- **encourager des actions partagées entre plusieurs institutions et organisations pour rassembler, stocker et conserver les contenus numériques ;**
- **rechercher des solutions nationales pour pérenniser la collecte, la sélection et l'organisation de documents culturels signifiants sur le plan historique malgré les changements de support ;**
- **assurer à long terme le stockage, la conservation et l'authenticité de ces collections et**
- **travailler à rendre accessible de façon pérenne le patrimoine numérique du peuple américain, dans le respect du droit d'auteur.**

Le NDIIPP fonctionne grâce à une dotation fiscale de 99,8 millions de dollars allouée en 2001 par le Congrès américain. En octobre 2002, « Conserver notre patrimoine numérique : plan pour une infrastructure nationale autour des contenus numériques et un programme de conservation » a été soumis à l'approbation du Congrès, approbation donnée en décembre 2002. Le plan, résultat d'un travail intense d'enquête, de planification et de consultation avec de nombreux décideurs, définit les étapes de l'effort national mené par la bibliothèque pour développer une infrastructure autour de la conservation du numérique, infrastructure constituée de :

- **un réseau de collaborateurs investis et**
- **une architecture technique permettant la collecte, le stockage et la conservation des documents.**
- **L'adresse du site internet du NDIIPP est la suivante : <www.digitalpreservation.gov>.**

Programa Nacional de Infraestructura y Preservación de la Información Digital

Laura Campbell, Bibliotecólogo
asociado para Iniciativas estratégicas
y Jefe de información,
Biblioteca del Congreso, EE.UU.

El Congreso solicitó a la Biblioteca del Congreso que liderara un programa de preservación digital a escala nacional, denominado formalmente "Programa nacional de infraestructura y preservación de la información digital" (NDIIPP, por sus siglas en inglés), en colaboración con otras entidades federales y no federales.

El objetivo del NDIIPP es:

- *incentivar la responsabilidad compartida entre muchas instituciones y organizaciones para la compilación, almacenamiento y preservación del contenido digital;*
- *buscar soluciones nacionales para compilación, selección y organización de materiales culturales de importancia histórica indistintamente de los formatos en evolución;*
- *asegurar el almacenamiento, preservación y autenticidad a largo plazo de esas colecciones y*
- *trabajar para lograr un acceso permanente del público, con los derechos protegidos, al patrimonio digital del pueblo estadounidense.*

El Programa nacional de infraestructura y preservación de la información digital cuenta con el financiamiento de una asignación fiscal de 2001 de $99,8 millones realizada por el Congreso de los Estados Unidos.

En octubre de 2002, el programa "Preserving Our Digital Heritage: Plan for the National Digital Information Infrastructure and Preservation Program" (Preservación de nuestro patrimonio cultural: plan para el programa nacional de infraestructura y preservación digital) fue presentado al Congreso para su aprobación, la cual fue concedida en diciembre de 2002. El plan, que es el resultado de una vasta búsqueda de información, planificación y consulta a una amplia gama de participantes, esboza los pasos que está dando la biblioteca para desarrollar una infraestructura de preservación digital formada por:

- *una red de socios comprometidos y*
- *la arquitectura técnica para sustentar la compilación, almacenamiento y preservación digital a largo plazo.*
- *El sitio web del NDIIPP se encuentra en <www.digitalpreservation.gov>*

DISCOURS DE CLÔTURE

Agnès Saal, Directrice générale de la Bibliothèque nationale de France a clôturé le Symposium en tirant les principaux enseignements de ces deux jours de débats.

CLOSING ADDRESS

Agnès Saal, Director General, National Library of France, closed the Symposium, drawing the major conclusions that had emerged from the debates.

La contribution du Centre technique de Bussy-Saint-Georges aux programmes de numérisation de la Bibliothèque nationale de France

Guillaume Niziers, département de la Conservation,
Dominique Théron, département de l'Audiovisuel,
Bibliothèque nationale de France


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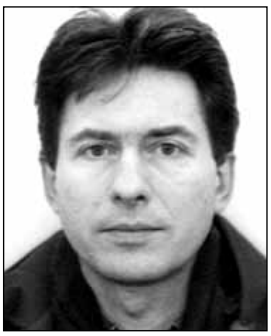
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Le Centre technique de Bussy-Saint-Georges (situé à 35 km de Paris sur le territoire de la ville nouvelle de Marne-La-Vallée) a ouvert en 1996. Dominique Perrault, l'architecte de la Bibliothèque nationale de France (site François-Mitterrand) à Paris, est également le concepteur de ce bâtiment dont l'architecture modulaire de type industriel est la particularité principale. La surface utile est de 9 000m^2. Une soixantaine de personnes environ y travaillent. On y trouve des magasins climatisés de grande capacité pour des collections peu communiquées, un atelier de restauration des livres et des documents en feuilles, un atelier de traitement des documents audiovisuels, un atelier de micrographie, un laboratoire scientifique et une unité de désinfection.

La Bibliothèque nationale de France est en train de concevoir un système d'archivage numérique répondant aux spécificités OAIS pour conserver à grande échelle des collections d'origines très variées. Elles peuvent résulter de campagnes de numérisation (par exemple, la Bibliothèque numérique Gallica qui offre 80 000 livres en consultation sur le Web), être constituées des documents nativement numériques qui entrent dans la BnF par la voie du dépôt légal ou bien être le produit de l'archivage du Web. La Bibliothèque nationale de France a l'intention de conserver ses collections numériques à travers le temps en épousant les évolutions technologiques, et d'offrir le plus large accès sur le Web aux documents libres de droits. Les autres documents seront eux consultables seulement dans l'enceinte de la bibliothèque pour un usage de recherche.

Pour sa part, le Centre technique de Bussy-Saint-Georges contribue aux opérations de numérisation dans deux domaines : la presse quotidienne nationale rétrospective et l'audiovisuel.

LE PROJET DE LA PRESSE QUOTIDIENNE NATIONALE

La BnF a décidé de numériser environ trente titres correspondant aux plus grands quotidiens nationaux, du XIX^e siècle à 1944, la Libération représentant un tournant dans l'histoire de la presse.

Le système d'information donnera accès aux journaux à la fois en mode image et en mode texte. L'image offre le fac-similé de l'original. Le mode texte résulte de la reconnaissance optique de caractères effectuée à partir de l'image numérique.

Ce programme de cinq ans a commencé en 2005. Il est prévu de numériser 2,5 millions de pages pour un budget d'environ 4 millions d'euros (tout compris).

La BnF a établi trois chaînes de production : une à Bussy-Saint-Georges, une autre dans son centre de Sablé-sur-Sarthe (dans l'ouest de la France) et une troisième confiée à un prestataire installé dans les locaux-mêmes de la BnF à Bussy-Saint-Georges pour éviter le déménagement des collections. Dans ce dernier cas, le personnel de la BnF travaille en étroite collaboration avec le personnel du prestataire dans toutes les étapes, en amont et en aval de la numérisation : le récolement fascicule par fascicule pour initialiser le fichier XML d'accompagnement des images et la préparation physique des documents avant prise de vues.

LE PROGRAMME AUDIOVISUEL

Les collections du département de l'Audiovisuel à Tolbiac sont constituées de documents sonores (un million), de vidéos (125 000), de documents multimédias (50 000) et de publications électroniques (30 000). Le Centre de Bussy-Saint-Georges conserve une collection de sécurité de ces documents.

En 2000, le département a établi un programme de conservation d'urgence pour répondre aux besoins les plus urgents définis par la combinaison de deux critères : l'état de dégradation physique des documents et/ou l'obsolescence des matériels de lecture. Les documents concernés sont les disques acétate (10 000) et les bandes magnétiques (15 000 bandes audio et plus de 100 000 vidéos). Ce programme devrait se terminer en 2008. D'autres priorités définies d'ici-là prendront la suite.

Les procédures sont les mêmes pour tous les supports : identification, nettoyage, numérisation (copie droite sans restauration), création des métadonnées et archivage de masse sur des bandes LTO de 100 Go (dont la capacité devrait encore augmenter dans un proche avenir). Cependant, le transfert vidéo est lui réalisé avec une compression MPEG 2 à 6 Mbits/s.

Le département a recherché une forte complémentarité entre la numérisation de type industriel, principalement confiée à des prestataires, faite sur des plateformes multi-lecteurs, et un environnement technique plus sophistiqué, pour l'essentiel entre les mains des techniciens de la BnF, réservé au traitement des documents les plus rares et les plus complexes techniquement.

The Bussy-Saint-Georges Preservation Centre: A Focus on Specific Digitisation Programmes

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Translated by Guillaume Niziers

The Bussy-Saint-Georges Preservation Centre (Marne-La-Vallée area, 35 km far from Paris) opened in 1996. Dominique Perrault, the architect, is the same who designed the new François-Mitterrand library in Paris. It attracts attention for its industrial modular design. The working area is 9 000 square meters. The staff is about 60 members. It houses preservation facilities: a high-density, environmentally-controlled storage building for low use collections, a conservation laboratory for printed materials, an audiovisual processing unit, a micrographic copying unit, a scientific laboratory and a disinfection unit.

The National Library of France (Bibliothèque nationale de France, BnF) is building an OAIS compliant digital repository for preserving large scale collections of all kinds of materials. These collections can be the results of digitisation projects, for instance the « Gallica » digital library which offers 80 000 books online, or made of natively digital items that entered the library collections through the legal deposit or the Internet archiving. The National Library of France intends to preserve its digital collections through time and changing technologies and give a wide acces to royalty-free materials on the Web. The other documents will be accessible only in the reading rooms for a research use.

The Bussy-Saint-Georges Preservation Centre has been asked to build two specific digitisation lines to take part in the French national daily press project and the other one in the audiovisual field.

The French National Daily Press Project

The library decided to digitise about thirty French national daily newspapers from the 19th century to 1944. At this date, the Liberation of France during the Second World War represents a turn in the press history.

The information system will give access to the newspapers in both image and text formats: the image format, a photographic facsimile of the original, preserves the visual appearance; the text format results from **O**ptical **C**haracter **R**ecognition (OCR) made directly from the digital image.

The five years programme began in 2005. The number of pages will rise up to 2.5 million. The funding programme totals about 4 million Euros. It includes salaries, equipement and internal and outsourced production costs, OCR.

The library has three production lines for this project: one in Bussy-Saint-Georges, one in another preservation centre in Sablé-sur-Sarthe (Western France) and the third one is out-

sourced but also located in the Bussy-Saint-Georges Centre. The BnF did not intend to move the collections. In that case, the BnF staff works in close cooperation with the company which signed the contract and takes responsibility in all the upstream and downstream activities: the date by date inventory to initiate the attached XML metadata file for each page, the holdings preparation prior to the picture shoot.

THE AUDIOVISUAL PROGRAMME

The collections of the Audiovisual Department are composed of sound (1 million documents), video (125.000 documents), mixed media (50.000 documents) and electronic publishing (30.000 documents). A double set of these collections is kept in Bussy-Saint-Georges.

Back in 2000, a safety plan was launched in order to meet the most urgent preservation needs, which are identified with a combination of two criterias: physical decay and/or obsolescence of reading equipments. The materials concerned are acetate records (about 10.000 items) and magetic tapes (15.000 audio tapes and more than 100.000 videotapes). This plan should end up in 2008 and be forwarded by other coming-up priorities.

The procedures are similar for all materials: identification, cleaning process, digitisation ('flat' transfer without restoration), creation of metadata and mass archiving onto LTO 100 GB tapes (capacity subject to increase in the next future), except for compression used in video transfers (MPEG2 at 6 Mb/s).

There is a strong complementarity between digitisation based on an industrial basis (mainly the fact of companies working for the library) using multi reading-machines platforms, and more sophisticated technical environments (mainly used by BnF technicians) reserved for rare materials and more hasardous technical cases.

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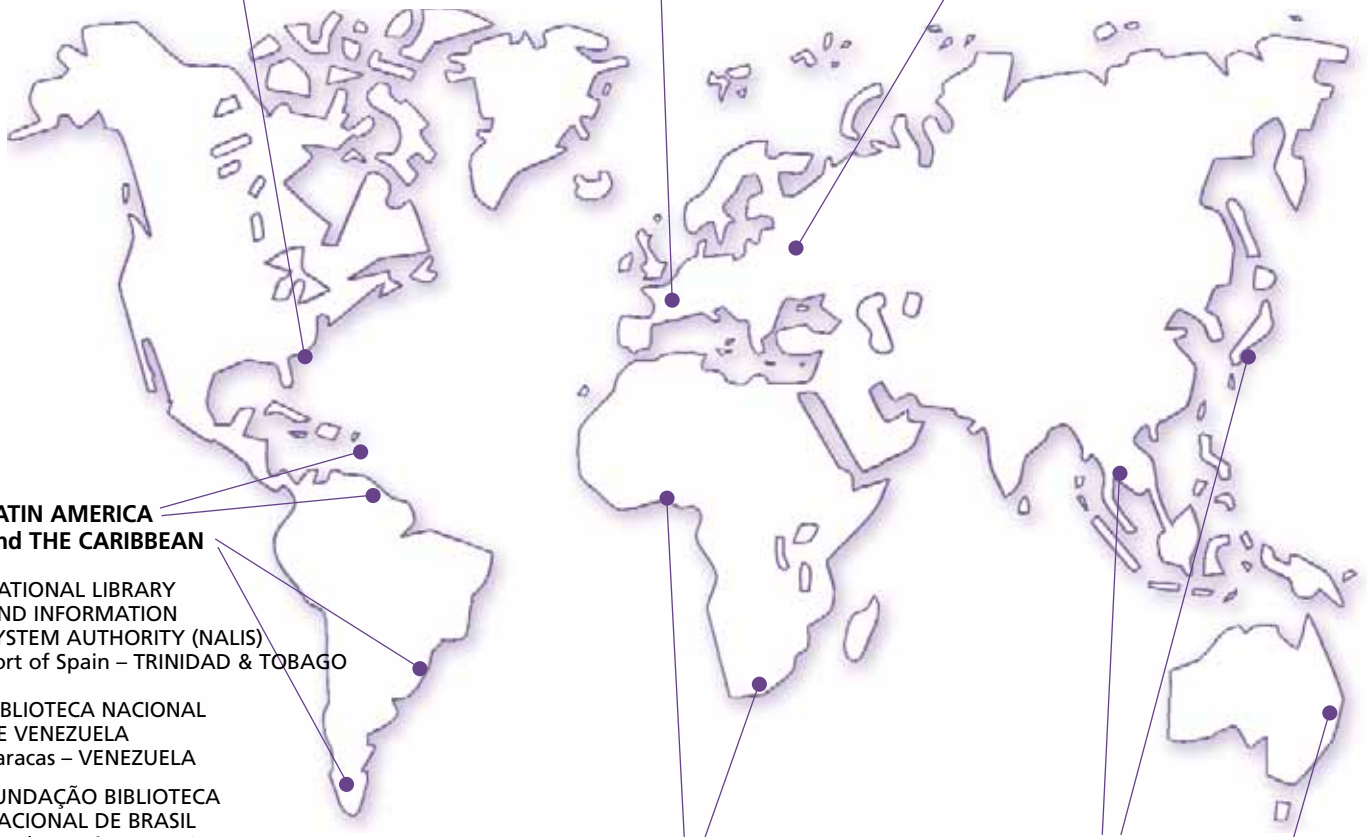

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