# International Preservation News

*A Newsletter of the IFLA Core Programme for Preservation and Conservation (PAC)*

***n° 14***
***May 1997***
***ISSN 0890 - 4960***

## Editorial

Since it was created in 1984 PAC has gone through various changes which were often linked to the generosity of the hosting libraries and the goodwill of the directors of Regional Centres. But there have been changes which have no professional background: the fall of the Berlin Wall and the reunification of East and West Germany induced great modifications within the development of the Regional PAC Centre in Leipzig, which was responsible for Eastern Europe until December 96. It is also a leader in mass deacidification and paper-splitting techniques.

The geographic area covered by Leipzig mainly includes the former Soviet Republics that have to cope with very painful and difficult economic challenges and have their own specific problems and solutions. As a consequence, the Deutsche Bibliothek decided to transfer the responsibility for the programme to these former Soviet Republics. A call for tenders was sent by IFLA HQ to major Eastern European libraries and associations. Hopefully we will be able to announce the creation of a new PAC Regional Centre during the IFLA conference in Copenhagen next summer. It is my pleasure here to thank the Deutsche Bücherei in Leipzig for having hosted the Centre since the beginning and particularly Wolfgang Wächter for his expertise and support, Henrik Otto and Monica Pfitzner whose enthusiastic energy have helped disseminate PAC influence and publications.

This issue may be surprising to you for various reasons. First, because it deals almost exclusively with the preservation of new carriers not traditionally found in library collections: photographs, audiovisual or digital documents. These are more difficult to preserve than paper-based documents because of their diversity, of the complexity of their multiple components and of the rapid obsolescence of the reading machines necessary to access the information they contain.

Our colleagues may not be specialists and may find it very difficult to deal with the abundant and increasingly out-of-date literature on the subject. Awaiting the new version of the "Principles" to be published, which should occur before the end of this year, in the meantime we have chosen to cover the theme of the preservation of new carriers throughout precise and concrete examples.

Another important change is: from now on articles will be published in their original form whatever the language (English, French or Spanish). Summaries in other languages will be provided in order to allow larger access to information.

We have also decided to issue IPN three times a year instead of twice previously (that is in May, August and December). We hope that the distribution of one more issue will not be too much of a burden for the Regional Centres.

Marie-Thérèse Varlamoff

## Editorial

Depuis sa création en 1986, le PAC a évolué et été le théâtre de nombreux changements. Les transformations souvent liées à la générosité des bibliothèques d'accueil ainsi qu'au dévouement des directeurs des centres régionaux ont parfois des origines sans lien aucun avec le monde des bibliothèques. Ainsi les transformations intervenues ces dernières années à la suite de la chute du mur de Berlin et de la réunification des deux Allemagne ont profondément influé sur le devenir du centre PAC pour l'Europe de l'Est à Leipzig, leader dans les techniques de pointe comme la désacidification de masse ou le clivage industriel du papier.

Le centre de Leipzig gérait un secteur géographique comprenant en majorité les anciennes républiques d'Union Soviétique qui, face à une situation économique difficile, sont confrontées à des problèmes très spécifiques. La Deustche Bibliothek a donc décidé de se désister pour céder la gestion du centre PAC aux pays concernés. Un appel d'offres a été adressé aux bibliothèques de ces pays et nous espérons pouvoir annoncer au Congrès de Copenhague la création d'un nouveau centre. Je voudrais remercier ici la Deutsche Bibliothek qui a hébergé le centre depuis sa création et son directeur, le professeur Wolfgang Waechter pour le soutien qu'il a apporté ainsi qu'Henrik Otto et Monica Pfitzner dont le dévouement et l'enthousiasme ont animé le centre.

Ce numéro d'IPN vous surprendra sans doute à plusieurs titres. D'abord parce qu'il traite principalement de la préservation de supports non traditionnels, plus communément appelés nouveaux supports. Que ce soient les photographies, les documents audiovisuels ou les documents électroniques, ils sont plus difficiles à conserver que les documents papier ou les livres du fait même de leur diversité, de la multiplicité et de la complexité de leur composants, et de leur mutation rapide. Hormis les photographies, ils impliquent en outre une lecture assistée par l'intermédiaire d'une machine, qu'il faut maintenir également en bon état de fonctionnement.

Nombreux sont les collègues qui, non spécialistes, éprouvent de grosses difficultés à se repérer dans l'abondante littérature sur le sujet, vite obsolète, faut-il le préciser. Nous n'avons pas la prétention de répondre ici à toutes les attentes. Nous avons préféré, avant la publication en fin d'année de la nouvelle version des "Principes", illustrer notre propos par quelques exemples et expériences concrètes.

Autre surprise, les articles seront dorénavant publiés dans leur langue d'origine (anglais, français ou espagnol) avec des résumés dans les autres langues, ceci afin de permettre au plus grand nombre d'accéder plus directement à l'information.

Enfin, il nous a semblé qu'un effort devait être fait pour augmenter le rythme des parutions et nous avons décidé qu'à partir de 1997 *IPN* paraîtrait trois fois par an (en mai, en août et en décembre) au lieu de deux précédemment. Nous espérons que la surcharge de travail liée à la diffusion pourra être assuré en par les centres régionaux.

Marie-Thérèse Varlamoff

## European Meeting on Paper Conservation: Recommendations

**On March 20-22, 1997 a European Meeting on Paper Preservation was held in the Royal Library of the Netherlands. It was organized by the Dutch Government, and attended by government officials, NGOs, archivists, librarians and scientists, representing the EU member states. Marie-Therese Varlamoff represented both IFLA and France.**

The participants in the European Meeting on Paper Preservation emphasized the need to implement urgent preservation measures, in order to guarantee optimal long-term access to the substantial paper collections in archives and libraries, which will continue to be of essential importance in the information society.

The Meeting acknowledged that the primary responsibility for the preservation of their own national cultural heritage lies in the individual EU member states.

It was concluded, however, that mass-preservation is a complex problem. To tackle it efficiently a combination of national and international efforts is required in the fields of research and methodology, training and education, registration and awareness raising.

The Meeting endorsed the steps already taken with regard to international cooperation in the preservation of archival and library materials, especially within the framework of the activities of IFLA's International Core Programme for Preservation and Conservation, the ICA and the UNESCO Memory of the World Programme.

The Meeting stressed the need to intensify support for the European Commission on Preservation and Access in its mission to further collaboration between libraries, archives and allied organizations to ensure preservation of the European printed and written cultural heritage. Likewise it called for wider participation from member states in the European Register of Microform Masters, thereby enhancing its function to avoid duplication of efforts.

Taking the above into consideration the Meeting requests the Council of European Ministers for Culture to ensure that existing initiatives, such as the proposed programme RAPHAEL (DG X), as well as new programmes, recognize the importance of long-term access to information.

*The Meeting recommends the Council of European Ministers for Culture to initiate action on the following priorities:*

1. *Establishing, on the basis of the framework provided by the ECPA, a permanent clearing-house function, to be maintained for the dissemination of information and exchange of experience on research as well as national and international policies and practices in the field of preservation.*

2. *Initiating a concerted action of different parties from the private and public sector (publishers, manufacturers of paper and other media, preservation suppliers, archivists, librarians, etc.) in order to stimulate innovative and competitive solutions to ensure the permanence and accessibility of information preserved in archives and libraries.*

3. *Developing and implementing a broad promotional campaign across Europe to enhance awareness of the risks threatening the memory of Europe and the need for action to guarantee optimal long-term access to the paper collections in archives and libraries in the information society.*

## Recommendations européenne sur la conservation des documents papier

**Du 20 au 22 mars 1997, le gouvernement néerlandais a organisé à la Bibliothèque Royale des Pays-Bas une réunion européenne sur la conservation des documents sur papier.**

**Responsables gouvernementaux, ONG archivistes, bibliothécaires et scientifiques, étaient présents ainsi que les états membres de l'U.E. Marie-Therese Varlamoff représentait l'IFLA et la France.**

Tous les participants ont insisté sur la nécessité de mettre rapidement en oeuvre des mesures de conservation, de façon à garantir à long terme le meilleur accès possible aux importantes collections sur papier qui se trouvent dans les bibliothèques et les archives et qui continueront à être d'une importance capitale au sein de la société de l'information.

Les participants ont reconnu que c'est à chacun des états membres qu'incombe la responsabilité première de conserver son propre patrimoine.

Les conclusions ont toutefois souligné la complexité du problème de la conservation de masse. Pour y faire face efficacement, une synergie des efforts entrepris au plan national et international s'impose dans les domaines de la recherche et de la méthodologie, de la formation et de l'éducation, de l'enregistrement et de la sensibilisation.

Les participants ont approuvé les initiatives de coopération internationale déjà entreprises en faveur de la conservation des documents d'archives et de bibliothèques et en particulier celles du Programme Fondamental de l'IFLA sur la Conservation et la Préservation, du CIA et du Programme "Mémoire du Monde" de l'UNESCO.

Les participants ont souligné la nécessité de soutenir l'action de la Commission Européenne pour la Conservation et l'Accès dans sa mission de développer la collaboration entre bibliothèques, archives et organisations apparentées afin d'assurer la conservation du patrimoine culturel européen, imprimé et écrit. Ils ont également appelé à une participation accrue des états membres au Registre Européen des Microformes Mères (EROMM), ce qui permettra de renforcer sa fonction d'éviter tout double emploi dans les efforts entrepris.

En tenant compte de ce qui vient d'être énoncé, les participants demandent au Conseil des ministres européens de la Culture de veiller à ce que les initiatives existantes, comme le projet de programme RAPHAEL (DG X) ainsi que tous nouveaux programmes, reconnaissent l'importance de l'accès à l'information sur le long terme.

*Les participants à la réunion recommandent au Conseil des ministres européens de la Culture d'entreprendre des actions sur les points prioritaires suivants :*

1. *Etablir, sur la base du cadre déjà fourni par l'ECPA, un bureau permanent ayant pour fonction de diffuser l'information et d'échanger les expériences en matière de recherche ainsi qu'en matière de politiques et de pratiques, au plan national et international, dans le domaine de la conservation.*

2. *Entreprendre une action concertée impliquant les différentes parties prenantes du secteur public et privé (éditeurs, fabricants de papier et d'autres supports, prestataires de service en matière de conservation, archivistes, bibliothécaires, etc.) de manière à susciter des solutions innovantes et compétitives visant à assurer la permanence et l'accessibilité à l'information conservée dans les services d'archives et les bibliothèques.*

3. *Développer et mettre en oeuvre une vaste campagne de promotion à travers l'Europe afin de sensibiliser aux risques menaçant la mémoire de l'Europe et à la nécessité d'agir pour*

*garantir sur le long terme, dans la société de l'information, le meilleur accès posssible aux collections d'archives et de bibliothèques sur support papier.*

## Survey of Endangered Audio Carriers

**The following two texts, by G. Boston and D. Schüller respectively, introduce audio carriers from different viewpoints and complete each other.**

**As part of the "*Memory of the World*" programme UNESCO has asked IASA, International Association of Sound Archives, to help with the compilation of endangered audio recordings held in public and private collections. George Boston, member of IASA Technical Committee, has reviewed the results of a questionnaire that was sent around the world.**

For many years, it was assumed that the polymers (commonly called plastics) used to hold the sounds and images in the various libraries and archives around the world were stable. The film world was the first to become seriously concerned about the decay of carriers - the problem was all too often illuminated by the spontaneous combustion of cellulose nitrate films. This led the Fédération Internationale des Archives du Film (FIAF) to carry out a survey in the early 1990s to locate the remaining nitrate films with the aim of speeding their copying and preservation and helping to ensure that scarce resources were used to the best effect. The survey located about 168 million metres of nitrate film that required copying to preserve it.(1)

In 1993, the Library of Congress carried out a sample survey of organizations that store audio, motion picture film and video material.(2) The aim of the survey was to get some idea of the size of the holdings worldwide of the various types of carriers used to preserve sounds and moving images. Eastman-Kodak helped fund the work. Of the 500 questionnaires distributed, there were 159 usable replies. The results showed that these 159 institutions held between them 23,660,379 audio carriers, 3,214,512 cans of film and 2,931,587 video recordings. The total holdings in the world are estimated to be at least ten times greater.

### Background

Much useful information was provided by the FIAF and Library of Congress surveys, not least that the scale of potential preservation problems was much larger than generally realized. In 1995 at the annual meeting of the Round Table on AV Records(3), UNESCO offered to help fund a survey to carry out a closer investigation of the condition of the world's sound collections as part of the "Memory of the World" Programme. IASA was contracted by UNESCO and the IASA Technical Committee undertook the actual work. As with the Library of Congress survey, it was by means of a mailed questionnaire.

Over 800 forms were distributed - some in French but most in English - and 148 replies were received from 46 countries. The rather low response must be taken as a sign that "questionnaire fatigue" is affecting many institutions. The collections that did respond are to be thanked for their help. In many cases it is clear that much work went into completing the questionnaire.

### Exchange of Assistance

As part of the survey, respondents were asked if they were willing to offer help to others and on

what basis or if they would like to receive a visit or telephone call to advise on problems. It was encouraging to see that over 30% of the respondents were prepared to offer help; in some cases, potentially without charge. Over 40% of the respondents said that they would like some assistance. Several "pairings" of collections offering and requiring help have been set in motion and others will follow.

Of those wishing to receive help, the vast majority said that they needed advice about storage conditions, digital formats and methods of transferring sounds to new carriers. These are basic matters for any collection and can be the subject of training seminars and workshops. Several of the respondents said that they felt the lack of opportunities to meet and discuss mutual problems with colleagues from other institutions. Although the annual conferences of the NGOs or the Joint Technical Symposia provide excellent opportunities to meet others working in the field, not every institution can afford to send people to these events. I am sure that the position within IFLA is the same as that in IASA. There is a great desire and willingness to assist with the running of training seminars but this is not possible without outside funding.

## Results of the Survey

Overall, nineteen types of sound carrier appeared in the replies. Respondents were asked to place their collections into three categories: good condition; giving some concern; obviously decaying.

The classifications are not scientific. They are broad, imprecisely defined groupings that provide a rough indication of the condition of the collections without requiring enormous amounts of research by the respondents.

Older formats such as cylinders, acetate discs, shellac discs and acetate tapes are where the major problems lie. Of these, the acetate discs and acetate tapes are the biggest potential loss to the heritage of the world. This is because they are mainly unique recordings, whereas the vast majority of cylinders and shellac discs are recordings issued commercially in large quantities. If one collection loses a cylinder, there is a good chance that it will exist in another collection.

In general, these particularly endangered categories of sound carrier are best referred to an archive with specialist technical staff and equipment. It is probable that more damage will be caused to these classes of carriers by inexpert attempts to restore and play them than by leaving them on the shelf.

## Cylinder Recordings

Cylinder recordings were the first major mass produced home entertainment system. They were made from about 1890 to 1929. Cylinders are unusual in that the stylus does not move from side to side as with LP records but up and down giving rise to a "hill-and-dale" movement of the pick-up. The copying of cylinders cannot be done using the original Phonograph machines. The now fragile cylinders would be destroyed in playback. New machines with lightweight pick-ups must be specially made for the task.

Although duplicates exist of many cylinders, any collection possessing cylinders but lacking technical expertise is still strongly urged to arrange for copying to be undertaken at an institution specialiZing in the work. A total of 96,855 cylinders were reported from 34 collections of which fewer than 30% were classed as being in good condition.

## Acetate Discs

Acetate discs were commonly used by broadcasters and others for recordings before the advent of tape. This means that the vast majority of acetate discs hold unique recordings. The discs were used for a longer period than is generally realized. The BBC, for example, was making some news recordings on acetate discs as late as the end of the 1960s.

The discs consist of a backing plate - usually of aluminium but other materials such as glass, rubber and cardboard are not uncommon - coated with a layer of soft cellulose acetate. The coating is soft enough to be cut easily by a cutting stylus and sufficiently resistant to wear to allow the disc to be played several times before groove wear becomes a major problem.

The major decay problem is that the coating slowly shrinks. If the storage conditions are not correct, the coating shrinks faster. This shrinkage sets up tension between the coating and the backing and leads to the surface cracking. In extreme cases, the coating becomes completely detached from the backing. The onset of cracking is sudden and unpredictable. It depends on the exact formulation of the coating, the storage conditions and the degree of adhesion between coating and backing.

If an acetate disc is in good condition with no sign of crazing or cracking, then it may be played on a modern turntable with a lightweight pick-up arm. A stylus suitable for use with coarse groove discs is essential. If there is any doubt about the condition of the disc or the suitability of the playback equipment, then don't play the disc. Seek advice. Of the 1,232,118 discs reported, only 10% are considered to be in good condition.

## Shellac (Commercial 78s) Discs

There were many companies issuing these discs from about 1890 to 1950. Although the playing and copying of these discs is not as difficult as with some other formats, there can be problems if care is not taken. The danger to this format is also reduced by the number of duplicate copies of many of the recordings that exist around the world.

Despite the common name for these discs, the 78 format was not as standardised as the LP record. For example, the correct player speed of a disc can vary between 60 and 90 revolutions per minute. The size of the groove and, therefore, the correct size of the stylus can also vary considerably. For a period beginning about 1913, some labels, including Pathé and Edison, issued discs with a "hill-and-dale" cut groove instead of the normal lateral cut groove. Of the 1,709,737 discs reported by 55 collections, 55% were classed in good condition.

## Vinyl Discs

These were introduced in 1948 and the format is only just becoming obsolete. The category includes long-playing records (LP) (33rpm) and 45rpm discs. As with cylinders and shellac discs, multiple copies exist of many of the discs. The players are still available as new and are relatively cheap.

A total of 3,539,814 discs were reported by 58 collections and over 95% were classed as being in good condition. Being in good condition does not mean, however, that a disc can be played without care. It is very easy to convert an LP from a good condition disc to a destroyed disc.

## Acetate Tapes

Acetate tapes was the first commonly used type of magnetic tape and was in use from the 1940's to the 1960's. As with all recordable formats, most of the recordings are unique. The base material of the tape is of cellulose di-acetate or tri-acetate. As with the coating on acetate discs, the backing shrinks if not stored correctly. It also becomes brittle and snaps easily if stressed.

The fragility of decayed acetate tapes makes it inadvisable to attempt to play them on a normal tape machine. Advice should be sought from an archive with specialist staff before attempting to play them. Instances have been reported of acetate tapes suffering from the "Vinegar Syndrome" - a decay process more commonly associated with safety motion picture films - but none serious enough to lead to the loss of the tape. Nearly 60% of the 784,093 acetate tapes reported by 13 collections were classed as giving concern or obviously decaying.

## Polyester Tape

s Polyester is the commonest base material for magnetic tape. In addition to its use as a base for a number of magnetic tape formats, polyester is increasingly used for making photographic films. When pure, ie. without a magnetic coating, polyester is probably the most stable polymer commonly available today. With a coating of film emulsion or magnetic particles the life of the polymer is reduced. The life of a correctly stored polyester based tape can be in excess of 50 years but it would be better to base any copying programmes on a shorter life expectancy.

In the form of 1/4 inch tape, 70 collections reported 2,161,941 polyester tapes of which 77% were classed as being in good condition. Packaged as R-DAT tapes, 85,202 tapes were reported by 10 collections with almost all of them classed as in good condition. Concerns were expressed by some collections, however, about the continuing availability of the machines needed to play R-DAT tapes.

245,630 compact audio cassettes were reported by 20 collections with about 75% being classed in good condition. As with LP discs, care is still needed when playing tapes in good condition. It should be remembered that the tape is probably unique.

## PVC Tapes

Another common base material for tape is polyvinyl chloride or PVC. This is a stable base for magnetic tape but is not used as widely as polyester. A total of 1,203,235 1/4 inch tapes were reported by 19 collections. Almost all were classed as being in good condition.

## Compact Discs

This is one of the most modern formats for storing sounds. The basic format is also used to store images and computer data. A recordable version is now available and is being used by a number of collections as the target medium for access and preservation copies of older carriers. A laser is used to access the data on the discs which means that there is no physical contact with the disc during playback. Again this does not mean that the discs can be handled without care. Despite the early publicity about the ruggedness of the discs, they are still delicate, high precision articles. Copies of the commercially produced pressed discs will exist in many collections. Many of the recordable CDs are unique recordings. 318,311 CDs were reported by 20 collections. Two

collections with about 25% of the total number of discs expressed some concern about the format.

## Other Carriers

Some rare and unusual carriers were reported. Six collections possess a total of 7,800 piano rolls of which only 10% were in good condition. On the other hand, the 5,013 metal music box discs shared by three collections were 100% in good condition.

The report of a small collection of Philips-Miller recordings underlined the need to preserve equipment as well as carriers. The Philips-Miller recorder physically cut the emulsion away from exposed motion picture film to leave a clear section of film of varying width. On playback a narrow beam of light is shone through the cut away sections of emulsion onto a light sensitive pickup to give an output signal that varies with the width of the clear section of film. The recordings are in good condition but there is no known player in working order in the world. I hope, however, that I will be proved wrong about this.

## Acetate Discs and Tapes Are at Risk

The results of this survey have confirmed the thoughts of specialists in the field about the carriers that should be given priority in any programme for copying. At the top of the list are acetate discs and tapes followed by cylinders. Unless particular problems exist in a collection, other carriers can be given a lower priority.

A major problem that has been identified is the lack in many collections of the technical expertise needed to identify problems and to take action to preserve the sounds. One reason for the problem is the great number of small collections, particularly in Europe, North America and Australasia. Many of these are highly focused private collections of commercial recordings and they have little or no long-term security. Other small collections, often of unique oral histories, are housed in public libraries. The storage conditions vary greatly and many collections are in climatic conditions unsuitable for long-term preservation.

The provision of playback machines can also be foreseen as a growing problem. The current need to make modern versions of cylinder players will be extended in the future to other formats. The cost of such machines may, however, be beyond the resources of any but the largest institutions.

The survey continues. IASA is still receiving information, albeit infrequently, and would be pleased to receive more. Questionnaires can be obtained from the author of this article.(4)

## References


1. More information about the nitrate film survey can be obtained from FIAF, 190 Rue Franz-Merjay, B-1180 Brussels, Belgium.

2. More information about the Library of Congress survey can be obtained from the Preservation Office, Library of Congress, Washington D.C. 20540-4500, USA.

3. The Round Table of AV Records is an annual meeting that brings together representatives of FIAF, FIAT (the International Federation of Television Archives) and IASA (the

International Association of Sound and AV Archives) and representatives of the AV committees of IFLA and ICA to help foster co-operation in the field of sound and moving image collections.

4. For further information about the survey or for copies of the questionnaire, contact George Boston, Member of IASA Technical Committee at 14 Dulverton Drive, Furzton, Milton Keynes, MK4 1DE, United Kingdom.

## Enquête sur les collections audio en danger

Dans le cadre de "Mémoire du Monde", l'Unesco a demandé au comité technique de IASA (International Association of Sound Archives) d'enquêter sur l'état des collections audio. Sur 800 questionnaires envoyés, 148 réponses sont parvenues. Cela a permis de mettre en contact des institutions susceptibles d'apporter leur concours scientifique et technique avec d'autres institutions ne disposant d'experts.

D'autre part, les résultats mettent en évidence les types de supports les plus menacés. Parmi eux, les disques et les bandes acétate figurent en tête de liste. Les premiers ont été produits jusqu'en 1960. Les secondes sont apparues entre 1940 et 1960. Tous deux présentent des risques de retrécissement au niveau de la couche de cellulose. Les cylindres, produits entre 1890 et 1929, sont aussi en danger de détérioration mais il ne faut pas copier les enregistrements avec des phonogaphes d'époque.

Enfin, les supports plus récents, comme les 78 tours ou les disques vinyle, y compris des bandes en polyester et en PVC, sont relativement en bon état. Malgré la publicité commerciale faite autour du CD, ce support est assez fragile : 25% des réponses reçues marquent une relative inquiétude. L'enquête a donc confirmé les présomptions des spécialistes : les conditions climatiques ne conviennent pas à la préservation à long terme de ces documents et l'obsolescence des appareils de lecture a de lourdes incidences économiques sur les coûts de reproduction.

## Sondeo sobre los soportes en peligro

En el marco del programa "Memoria del Mundo", la UNESCO ha solicitado al Comité Técnico de IASA (International Association of Sound Archives) realizar una encuesta sobre el estado de conservación de las colecciones de audio. De 800 cuestionarios enviados, se ha recibido 148 respuestas. Ello ha permitido poner en contacto a instituciones suceptibles de brindar su colaboración científica y técnica con otras instituciones que no disponen de expertos.

Por otra parte, los resultados ponen en evidencia los tipos de soportes que se encuentran más amenazados: los discos y las cintras de acetato encabezan esta lista. Los primeros se produjeron hasta 1960. Los segundos aparecieron entre 1940 y 1960. Ambos presentan riesgos de encogimiento al nivel del estrato de celulosa. Los cilindros, producidos entre 1890 y 1929, se encuentran también en peligro de deteriorarse. No es conveniente copiar los registros con fonógrafos originales.

Finalmente, los soportes más recientes, como los de 78 revoluciones o los discos en vinilo, incluyendo las cintas en poliéster y en PVC, presentan un estado relativamente bueno. Cabe destacar que a pesar de la publicidad comercial realizada en torno al disco compacto, este soporte es bastante frágil: el 25% de las respuestas recibidas señalan una relativa inquietud al

respecto. La encuesta entonces confirma las sospechas de los especialistas: las condiciones climáticas no se adecúan a la preservación a largo plazo de estos documentos y la obsolescencia de los aparatos de lectura tiene fuertes incidencias económicas sobre los costos de reproducción.

## Preserving Audio and Video Recordings in the Long-term

**Audio and video recordings are documents of ever increasing importance and significance. They are indispensable sources for many scholarly disciplines, the only true representation of orally transmitted cultures and, in a time of ever increasing electronic communication, they constitute one of the major sources of our contemporary civilization.**

The safeguarding of all these documents is widely associated with the keeping of books and other written materials. This may be partly because textual libraries have existed for more than 4,000 years, while audiovisual archives have been in existence for only less than 100 years. There is, however, a fundamental difference between audiovisual documents and printed materials which is commonly overlooked. The difference lies in the nature of the documents and in the different degrees of redundancy of information.

Printed matter represents human thoughts by the use of a stock of symbols. A certain amount of redundancy is intrinsic in speech and writing. Letters, sometimes even words, may be omitted without any real detriment to communication. In contrast, the audiovisual document is an analogue representation of a physical status or event: every part of such a document is information. While a speck of mould in a book does not normally hamper the understanding of the text, comparable damage on a photograph would cover up information, and, on a magnetic tape, it could even render the tape unreadable. Seen, therefore, from the perspective of redundancy, audiovisual documents call for a higher degree of protection and security than written materials.

A second reason for increased efforts to safeguard them is the vulnerability of the carriers and their components. A short survey of the most widespread audio and video formats and their specific stability issues will help to understand this problem.

### Phonograph Cylinders

Cylinders have been used since around 1889 for original recordings in the academic world and later also as mass produced recordings for the entertainment industry. While industrial production ceased in the late twenties, they continued to be used for field-recording until the fifties(!). Most cylinders are made of wax, some of the mass replicated cylinders are made from celluloid. There are about 300,000 cylinders in the custody of recorded sound collections worldwide. They are extremely brittle, fragile, and many suffer from mold. Fortunately, most of these holdings have already been transferred onto modern media and thus their contents, which are frequently of unique historical value, are already safeguarded.

### Shellac Discs

Coarse groove gramophone discs, commonly called shellacs or 78s, were the main mass produced audio format of the first half of our century. It is estimated that the worldwide stocks of this format amount to 10 million discs. They were produced from 1898 until the mid-fifties. The discs consist of various mineral substances bound together by organic substances like shellac or

similar binding materials. Although breakable when dropped, these gramophone records are fairly stable and there are no reports of a systematic instability problem.

## Instantaneous Discs

Prior to the introduction of magnetic tape, which occurred in the late forties and early fifties, so-called instantaneous discs were the only medium for audio recordings that could be played back immediately. The total number in existence amounts to three million. Practically all of these discs are irreplaceable originals, many of them of great cultural, historical and scholarly importance. Unfortunately, the largest group of these instantaneous discs, the "acetate discs", are at the greatest risk. These discs are laminates of aluminium, sometimes glass cores with a lacquer coating of nitrate or acetate cellulose. With age, the coating becomes brittle by a hydrolytic process: the lacquer then breaks apart, and flakes off. Thus a considerable portion of the holdings worldwide have already been lost. Even if transfer programmes were to be hastily established, further losses of irreplaceable information cannot be prevented.

## Microgroove Discs

From the late forties onwards microgroove discs (vinyl or long-playing records) replaced shellac discs and only relatively recently has this format been superseded and replaced by the compact disc (CD). The total number of microgroove discs in sound archives worldwide is estimated to be more than 30 million. They are made mainly of polyvinyl chloride. No systematic stability problems have arisen so far on a greater scale, but their stability in the long-term, namely for the next few centuries, is unknown.

## Magnetic Tapes

Magnetic media in the form of tapes on open reel or housed in cassettes are the most widespread carriers for audio and video data. Early audio tapes used acetate cellulose as the base film material, which is also used for safety film. Acetate cellulose has a tendency to become brittle through hydrolysis caused by the moisture contained in the atmosphere. This brittleness generally constitutes a serious problem in the playback of these old audio tapes. Produced until the mid sixties, they are at risk, and transfer onto other carriers must be envisaged.

Another group of historical audio tapes used polyvinyl chloride as the base film material. As with vinyl discs, these tapes have not exhibited any systematic instability; the long-term prospects are, however, unknown.

Polyester is the base film material which is used for all modern audio and video tapes. It has the greatest resistance of all base materials to mechanical stress and the influence of humidity. No systematic stability problems have occurred so far but, again, its stability over very long periods (centuries) is unknown.

Of the various magnetic materials used to store the information only metal powder, as used in more recent high density audio and video formats, has given cause for serious concern: early tapes of this kind suffered from corrosion but this problem now seems to be under control. There is no precise answer to the question of how long metal particle tapes will remain chemically stable. At this point it must be emphasized that, contrary to laymen's expectations, the magnetic information on chemically stable and properly handled and stored materials is not at risk.

The greatest problem related to magnetic tape is the stability of the pigment binder. A considerable number of audio and video tapes, especially amongst those produced during the seventies and eighties, are suffering from pigment binder hydrolysis. The atmospheric moisture is absorbed by the pigment binder causing the polymer to hydrolyse and lose its binding property. Tapes of this kind deposit a smear of magnetic particles onto the replay heads. This clogs the heads and swiftly makes the tape unreadable. Processes to render such tapes playable again are available, but the restoration process is cumbersome and time consuming. This problem has been found especially in hot and humid areas where many tapes do not last longer than a few years.

## Compact Discs

The compact disc (CD) and its forerunner, the laser vision disc (video disc) have both suffered from delamination, reflective layer corrosion, and crazing. All these problems render such discs unplayable. They have occurred mainly during the introductory phase of these products, and it seems that the problems have now been solved. The long-term stability, however, especially of the varnish on the upper side which protects the reflective layer, is under systematic investigation. More research is also required into to the stability of the recordable CD (CD-R).

In summarizing, it can be stated that the stability of all polymeric materials over long-term periods is limited. This has a major bearing on the stability of audiovisual data carriers: the vast majority of these consist of polymers, in many cases of a sandwich of polymers, where possible interactions between layers have also to be taken into account. It can, therefore, be unequivocally stated that there is no eternal audiovisual data carrier.

## The threat of hardware obsolescence

To achieve the aim of "eternal" preservation requires, therefore, that the information sooner or later has to be copied. In the analogue domain, however, each copy differs, if only slightly, from the original. With multiple copying, therefore, the information tends to zero. Even if we assume a fifty years lifetime of an average audio/video carrier, we would need twenty generations of subsequent copying to cover a millenium. Clearly the way to overcome this problem is to transfer all information into the digital domain where it subsequently may be copied to "eternity" without any alteration and loss. Over the last fifteen years, since the introduction of digital techniques, great hopes have been expressed in the audiovisual archive world that this technology would offer simple solutions to overcome the pitfalls of the analogue world.

However, the digital revolution has differed from what had been expected. Instead of the replacement of the hitherto few (if not single) professional analogue formats by one or two generally accepted digital formats, the competition between the producers of audiovisual equipment has led to the development of several competing formats which - due to an incredible progress in technology - were often outdated after a comparatively short time and superseded by new developments. This has sometimes occured even before the market had accepted the previous format. It has been especially true in the development of digital video formats where, to date, some eight formats have been developed, none of which has yet reached a dominant market position.

This situation inevitably leads to the threat of the obsolescence of hardware. There are several audio and video formats of which carriers exist in good condition but they can only be

transferred with difficulty and at great expense because of the lack of hardware and spare parts. Advancing technology is a highly aggravating factor in this process. While it is possible, though not inexpensive, to construct a new cylinder replay machine to play these early recordings with better fidelity than any machine of Edison's time, it is impossible in practice to build a CD-player or a digital video recorder once mass production has ceased and the last machine or its spare parts have been used up.

## Digital mass-storage systems are the solution

Seen from this perspective, the long-term preservation of audio and video data - if we speak in centuries - is hopeless: the carriers are unstable, the commercial lifetimes of the formats seem to become shorter and shorter and the amount of data to be stored is too big to allow manually operated subsequent copying from one commercially available format to the next, even if only 10 % of the amount of data available today is stored.

The solution lies in automatically accessible, self controlling and self re-generating archival systems. The features of such systems are:

- The management of audiovisual data as computer files in mass storage systems, e.g. jukeboxes of magnetic tape cartrigdes.
- An open file architecture to accommodate all audiovisual data together with catalogue/content information and written text.
- The access time of such systems is not of major importance.
- Data integrity is controlled automatically, and copying of the information onto new carriers (refreshing) is done automatically before errors cannot be longer fully corrected.
- Once new storage media and systems are available due to technical development, automated migration (transformatting) will be carried out.

First thoughts in this direction have been expressed 1989/90 and the first pilot installations are already operative within the ARD, the community of German broadcasters, and within archives of the phonographic industry.

While at the beginning of this develpoment there was a certain danger that safeguarding audiovisual materials would be carried out by using the newly developed data reduction (compression) algorithms, it has, at least in the audio domain, become generally accepted that data reduction (compression) is considered to be unethical because of its prejudicial technical effects on the further use of the material.

## What should be prioritized ?

If audiovisual preservation in the long-term can only be succesfully carried out in the digital domain then it would be interesting to have information on the order of magnitudes incurred. A study carried out by the Library of Congess gives an estimate on the worldwide holdings of audiovisual materials which can be used as a basis for calculating the digital storage capacity required for their safeguarding in the digital domain. The result is impressive: the worldwide audio holdings are estimated to amount to 45 million hours, corresponding to 30 Petabytes (i.e.

30.000 Terabytes) of digital storage space; the worldwide video holdings are around 9 million hours, amounting, in digital uncompressed format, to around 1 Exabyte (i.e. 1 million Terabytes). The annual growth rate is reported to be 5-10 % . Even in the unlikely event that by radical selection only 10 % of the worldwide holdings would be declared worthy of being kept for "eternity" the remaining 100 Petabytes would still be an enourmous challenge for the computer industry.

In view of the rapid development of digital systems is does not seem utopian to think that these future storage requirements will be successfully and affordably met. While in the beginning of the debate during the early nineties the biggest available mass storage system was capable of capacities up to 30 Terabytes, current development allows for the storage of 2.5 Petabytes. In principle, there is no limit to the further expansion of the capacity of such systems. Present systems are based on magnetic tape cartridges which are derived from digital video formats, but other media, e.g. optical tapes may be available in the future.

The problem of digitization seems not so much to be linked to hard- and software technology, the real problem is the transfer from the analogue to the digital domain. This is a very labour intensive process which requires, depending on the difficulty caused by the condition of the original document, a time factor of 1.5 up to 10 of the duration of the document. An average of a factor of 3 must be calculated. Therefore priorities have to be set in the transfer to the digital domain: first, only carriers which are endangered and in frequent demand should be transfered. The question of "what is endangered" is not so easily answerable. While it is obvious that all instantaneous discs and all historical tapes made from acetate cellulose are at risk and must be transferred, the greatest problem today is the prediction of the life expectancy of magnetic tape: while many tapes have survived successfully for several decades, tapes of more recent production particularly have caused replay problems.

Of greatest importance, therefore, is the intensification of systematic research into the life expectancy of audiovisual data carriers, especially of magnetic tape, and also of replicated and recordable CDs. It is imperative to know what kind of holdings are at immediate risk in our collections and which can wait. Without proper research tools we would waste time and money transferring the stable parts of our holdings, while other documents rot away unnoticed.

## Research on life expectancy must continue

As a result of this complex situation, the strategy for the safeguarding of audio and video materials in the long-term has to be twofold: in view of the enormous amount of analogue materials in association with the labour intensive task of transfer, taking into account the possible further improvement of transfer technology and digital resolutions, all effort should be undertaken to prolong the life of existing carriers to the maximun possible extent. As the complete preservation of all present holdings is not desirable, the necessary selection process will also be easier from a further distance. Emphasis, therefore, must be given to systematic research into the prediction of life expectancy of audiovisual data carriers and into measures to retard their decay. Hopefully, it will also be possible to develop, on a greater scale, measures to rejuvenate already deteriorated carriers.

For the long-term, however, it has become clear that self-controlling and self-regenerating digital mass storage systems are the answer for the safeguarding of audiovisual documents. This kind of concept will also provide a solution to overcome the scepticism vis-a-vis the safeguarding of

electronic documents as recently expressed by Jeff Rothenberg. Such mass storage systems are, at the same time, an indispensable prerequisit for the functioning of all kind of services in the forthcoming information age, to mention only "digital libraries" and "video on demand". Their prices will come within the reach of average budgets. Contrary to sometimes expressed fears this concept does not call exclusively for huge, centralized stores: it will also allow individually tailored solutions for smaller applications.

Thus, such systems could also be a solution for the preservation of documents in southern countries: while in hot and humid environments conventional audio visual preservation is generally insufficient due to the notorious lack of funds for the proper air-conditioning of storage areas, mass storage systems, requiring relatively small floor space, could be effectively air-conditioned at low cost.

## Selected bibliography

**Calas** M.-F. et J.-M. **Fontaine** . *La conservation des documents sonores* . Paris : CNRS Editions, 1996.

**Gibson** G.D. *Audio, Film and Video Survey. A report of an International Survey of 500 Audio, Motion Picture Film, and Video Archives* . Washington D.C.: Library of Congress, 1994. Partly published in "IASA Journal" 4, 1994.

**Häfner** A. *The Introduction of Digital Mass Storage Systems in Radio Broadcasting: A Report on the Progress within the ARD* . "IASA Journal" 3, 1994.

**Heitmann** J. *Zukünftige Archivierungssysteme* . "Fernseh- und Kinotechnik" 50,7, 1996.

**Rothenberg** J. *Ensuring the Longevity of Digital Documents* . "Scientific American" 272, January 1995.

**Schüller** D. *Auf dem Weg zum "ewigen", vollautomatischen Schallarchiv* . München: "Tonmeistertagung Karlsruhe Bericht", 1992, 1993.

**Schüller** D. *Introduction to Bit Rate Reduction and its Consequences for Sound Archiving* . "IASA Bulletin" 2, 1993, p. 32-35.

**Schüller** D. *Preservation of Audio and Video Materials in Tropical Countries* "IASA Journal" 7, 1996.

**Van Bogart** J. *Magnetic Tape Storage and Handling. A Guide for Libraries and Archives* . Washington D.C.: Commission on Preservation and Access, 1995.

## Note:

The Editor is indebted to UNESCO for permission to reprint this abbreviated version of an article, which was originally published in full in *Proceedings of the 1st International Memory of the World Conference, Oslo, 3-5 June 1996* . **Foster** Stephen, ed. Paris: UNESCO, 1996, p. 131-140.

## La préservation des enregistrements audiovisuels

A l'heure de la communication de masse par voie électronique, les documents audiovisuels sont plus que jamais les principales sources de témoignage sur notre civilisation. Contrairement aux documents écrits où certaines lettres manquantes ne nuisent pas à la communication du document, un document audiovisuel se doit d'être reproduit dans son intégralité, c'est pourquoi il requiert encore plus de protection. L'auteur énumère brièvement les différents types de supports depuis la fin du XIXè siècle et précise que la stabilité à long terme du disque compact n'est pas garantie.

Le meilleur moyen de sauvegarder l'information est de la recopier. Dans le domaine analogique, plus on multiplie le nombre de copies, plus il y a de perte. La technique de compression (réduction des données par algorithmes) s'est révélée contraire à l'éthique de conservation et n'est plus pratiquée de façon généralisée.

Le transfert sur support numérique est le seul système fiable de reproduction mais il est soumis à l'obsolescence des appareils de lecture. Il faut aussi résoudre le problème du transfert du domaine analytique vers le domaine numérique. Seuls les supports très menacés et ceux fréquemment consultés devraient être transférés. Une politique de transfert sans recherche préalable n'aurait aucun sens. La recherche doit aussi s'employer à définir la notion de "danger" car l'on ne connait pas encore précisemment la durée de vie des bandes magnétiques. Toute stratégie de conservation doit s'orienter vers la conservation préventive et la recherche. L'archivage numérique est la solution d'avenir pour garantie la pérénité des supports.

## Salvaguarda de registros de audio y video a largo plazo

Cuando se trata de la comunicación masiva por via electrónica, los documentos audiovisuales son más que nunca las principales fuentes de testimonio de nuestra civilización. Contrariamente a los soportes escritos, en los que las letras faltantes no afectan la comunicación de un documento, un documento audiovisual debe estar en perfecto estado, por lo que requiere aun más protección. El autor enumera brevemente los diferentes tipos de soportes utilizados desde finales del siglo XIX y precisa que la estabilidad a largo plazo del disco compacto no es una garantía.

La mejor manera de salvaguardar la información es recopiarla. En el analógico, a mayor multiplicación del número de copías, mayores son las pérdidas. La técnica de compresión (reducción de datos por algoritmos) ha resultado ser contraria a la ética de conservación y no se practica ya de forma generalizada.

La transferencia a soporte digital es el único sistema confiable de reproducción; sin embrago, está sujeta a la obsolescencia de los aparatos de lectura. Igualmente, es necesario resolver el problema largo y costoso de la transferencia en el campo analítico hacia el campo digital. Sólo deberla transferirse los soportes muy amenazados y aquéllos frecuentemente consultados. Una política de transferencia sin herramientas de investigación adaptadas no tendría ningún sentido. La investigación debe también emplearse para definir la noción de "peligo", puesto que no se conoce todavia con precisión la duración de la vida de las cintas magnéticas. Toda estrategia de conservación debe orientarse hacia la conservación preventiva y la investigación. El archivo digital es la solución del futuro para garntizar la permanencia de los soportes.

Dietrich Schüller
Director Phonogrammarchiv
Austria

# Training on Managing and Conserving Audiovisual Carriers

**Those who take care of audiovisual materials need specialized skills in order to manage, collect, store, handle, conserve, preserve and even restore vulnerable materials. Much of the audiovisual heritage is at risk, either because of its inherent nature, for example nitrate film, magnetic tape or colour photography, or because of improper care, storage and handling through ignorance or neglect.**

In order to save some of the materials, wholesale restoration may be needed, and in order to prevent this expensive process the 'curator' of the original materials bears a heavy responsibility to ensure that staff are properly trained, not only in correct handling methods and conservation principles, but also that technical staff have the necessary expertise to rescue the material at risk as well as a firm grounding in the principles of conservation and archival practice.

While education for traditional archive careers is possible in many developed countries, no university, film or TV school specializes in A/V archive operations.
This is especially the case for technical staff. There is a wide gap between intent and provision of education. The qualifications for working in film, television and sound archives have been acquired to date through most scientific disciplines, long professional experience, in-training and individual effort. Scientific and technical archive training must be provided through technical disciplines, but archive technicians need additional skills for archival or long-term preservation - how far to venture into restoring ? Will this material be a true representation of the original "performance", or an enhanced version for the modern eye or ear?

## Archive technicians need a wide range of skills

The objectives of an archive are not always the same as those of a production company wishing to re-distribute. Simply to restore material is not enough - it must be done with great care and respect to the original intention of the creator. Technological advances give rise to ethical and theoretical questions concerning the potential manipulation of original audiovisual documents. The technician needs to have an acute awareness of the potentialities and pitfalls of the developing technology.

The range of skills required by an archive technician is very wide, but it is unlikely that one person can be an expert in all the required areas, however a basic understanding of all the processes involved with a deep understanding of one or two areas is not an unreasonable demand.
For example, in a small film archive, the technician is likely to be expected to be knowledgeable about the film processing systems, the chemical degradation of film, the optics of the projectors, the acoustics of viewing theatres, the mechanics of viewers, the maintenance of the electronic and electrical apparatus and, in the spare moments, program the computer for the cataloguers.

Prospective archive technicians should achieve a good, general education covering the sciences and technology and mathematics. The standard of education required will vary depending upon the entry level into the archive. It should be remembered, however, that qualifications alone do not make a good archive technician. There are practical skills that cannot easily be taught in a school or university environment. Recruits to an archive have to be trained within the archive community to the required technical and ethical standards.

## Archives must budget the training of new recruits

Certain prerequisites for recruits have to be considered: those intending to seek work in a photographic and/or film archive need a major in chemistry and optics. Sound, electronics and computing should also be covered. Those intending to work in a video archive should major in electronics and optics. Chemistry, sound and computing should also be covered. Those intending to work in a sound archive should major on the properties of sound, electronics and mechanics. Chemistry, optics and computing should also be covered.

The specialized training will almost certainly have to be organized by the archive. There are at present no courses of higher and/or vocational education for sound and moving image archive technicians at any college in the world. The archive must, therefore, budget both time and money for training new recruits.

In addition to the practical, on-the-job training, tuition in the basics of cataloguing, the history of the media and the ethics of preservation must be included to help underline the difference between the role of an archive technician and the role of a technician in industry.

The Technical Department is essential to the work of the archive. The skills and experience that the technical staff bring to the archive are diverse and require proper training at all levels. Because of the lack of colleges and university courses teaching the required skills, the archive technician is sometimes seen as being less of an archive professional than say, one of the cataloguing section. It is impossible to separate out the technicians' role in a sound and image archive. As with the other departments, it is woven into the structure and operation of the archive. For example, without the cataloguing section, it is impossible to find the required material; without the technical department, the material will not be usable. The two departments are in a symbiotic relationship.

## Digitization still presents many pitfalls

Most of the staff in an audiovisual archive need some technical training, but technical expertise is at different levels. There are the administrative staff to consider, the specialists in documentation, selectors, generalist staff who all have to be trained in the rudimentary techniques of handling and storing the material - if for no other reasons than preventive considerations - how not to damage materials and put them in danger. Technical staff are needed here to guide the generalist staff.

So far we have been concerned with audiovisual materials but have not mentioned the conservators - these range from paper conservators to that most visual of the audiovisuals, photographic conservators. These, although they may not acknowledge the fact, are better served by education and training than the other curators of audiovisual carriers. They too require technical expertise and education in particular disciplines such as chemistry, physics, electronics.

In the 1990s digitisation has been the vogue - sometimes thought of as a panacea and technicians have had to be trained in this field in order to spot the pitfalls. Digital technology has become something of a boon to many areas of information science, but the audiovisual scientists are quite cautious. The literature abounds with examples of successful digitisation of still images, but when it comes to the even more complex moving images and sound technology warning notes are being sounded. It appears that sometimes the quality of the final product is not as good

as it could be, and the processes with moving images are often too expensive for the archive to contemplate. The irony of this is that although material may be digitised, for archive purposes, the archive prefers to keep the original wherever possible, in case some better technology turns up in future.

Such are the requirements for the education and training of the audiovisual technician. How well does the reality match ? The answer is poorly. There is sketchy coverage and inadequate provision. The technician at best relies on in-training after a grounding in a scientific discipline and some work experience in a commercial situation: a television or radio station, a film production unit, or a laboratory.

## Short courses are limited in time and available to a few

There have been a number of initiatives to provide education but little continuity. Departments of universities studies such as East Anglia University (UK), Humboldt University (Potsdam), Danish School of Conservation, Manchester University (UK) have postgraduate courses in archival studies. Departments of library and information also present audiovisual archive courses.
The International Federations of Film, Television and Sound Archives present Summer Schools and short courses, the Technical Co-Ordinating Committee presents Joint Technical symposia although these are gatherings of experts rather than training courses. The problem with this provision is that the programmes are limited in time and available only to a few. It is seldom aimed at the technician.
The regional av archive association SEAPAVAA (South East Asia Pacific Audiovisual Archive Associations) is presenting seminars and Summer schools in various aspects of av archiving and will present one on technical aspects in 1998.

Several meetings of audiovisual archivists and UNESCO have been organized to investigate the situation. International meetings of experts in Berlin (1987); in Paris (June 1988-1989) and in Vienna (1994) have been held. A UNESCO report is the outcome of such consultation: *Curriculum Development for the Training of Personnel in Moving Image and Recorded Sound Archives*, PGI-90/WS-9, UNESCO, 1990.
An important task was to seek out the most suitable places to present a curriculum for audiovisual archivists: is it in library and archive schools, universities, schools of conservation. It was also suggested that training for a specialism should be in addition to training in general archival principles; one should not start with the specialization, but lead on to it from a more general education.

But does this help the technician? They can well benefit from a general course in audiovisual archivism but it is not essential. Where their training and expertise are important is in the scientific education they have acquired and the experience in archive work. In short until better provision can be made, the best training an audiovisual technician can receive is from a responsible audiovisual archive, after acquiring technical knowledge and practical experience.

Acknowledgement: My thanks go to George Boston and the Technical Co-ordinating Committee for their guidance and assistance in formulating this article.

## La formation des restaurateurs en audiovisuel

La sauvegarde des archives audiovisuelles dépend des disponibilités en personnel spécialisé dans leur restauration. S'il existe une formation technique générale en archives audio, aucune école au monde n'enseigne comment restaurer ces documents.

Un technicien d'archives doit avoir des connaissances solides en sciences, technologie et mathématiques mais aussi en chimie, électronique, optique et en son selon la spécialité qu'il choisira. Mais c'est aux archives elles-mêmes d'assurer son perfectionnement pratique, notamment dans le transfert de l'information en mode numérique.

Quelques universités européennes et des associations comme la FIAF et la SEAPAVAA proposent parfois des cours de perfectionnement mais les tentatives sont encore trop timides et insuffisantes. L'UNESCO a organisé plusieurs réunions de réflexion sur ce thème qui ont fait l'objet d'une publication dans les Etudes RAMP *Curriculum Development for the Training of Personnel in Moving Image and Recorded Sound Archives, PGI-90/WS-9, 1990*.

Dans l'attente d''initiatives plus probantes, la meilleure formation dont puisse bénéficier un technicien après des études théoriques reste l'expérience dans un service d'archives responsable en matière de conservation.

## Capacitación en gerencia y conservación de soportes audiovisuales

La salvaguarda de los archivos audiovisuales depende de la disponibilidad de personal especializado en su restauración. Si bien existe una formación técnica general en archivos de audio, ninguna escuela del mundo enseña cómo restaurar estos documentos.

Un técnico de archivo debe tener conocimientos sólidos en ciencias, tecnología y matemáticas pero también en química, electrónica, óptica y sonido, según la especialidad que escoja. Sin embrago, le corresponde a los archivos mismos garantizar su perfeccionamiento práctico, especialmente en la transferencia de la información a modo digital.

Algunas universidades europeas y asociaciones como la FIAF y la SEAPAVAA ofrecen de vez en cuando cursos de perfeccionamiento, pero las tentativas son todavia demasido tímidas e insuficientes. La UNESCO ha organizado varias reuniones de reflexión sobre este tema que han sido objeto de una publicación en los Estudios RAMP: Curriculum Development for the Training of Personnel in Moving images and Recorded Sound Archives, PGI-90/WS-9, 1990 (Desarrollo curricular para la capacitación del personal en archivos de cine, video y sonido grabado).

En la espera de iniciativas más convincentes, la mejor formación que puede recibir un técnico despuès de sus estudios teóricos es la experiencia que adquiere en un servicio de archivos que se responsabilice por la conservación.

Helen P. Harrison
Media Librarian at the Open University
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## Preservación cinematográfica de Biblioteca Nacional de Venezuela

**En el Archivo Audiovisual de Venezuela el Cine y el Video además de ser instrumentos para la diversión y el conocimiento, son sobremanera documentos que testimonian nuestra historia. Es por ello obligación del Archivo conservar este patrimonio para transmitirlo a**

**las futuras generaciones.**

Otras instituciones en Venezuela realizan meritorios esfuerzos, para salvar al cine del deterioro con sus propios recursos, como es el Caso de Bolívar Films y de la Cinemateca Nacional quienes realizan Preservación Activa y Restauración de películas venezolanas que constituyen importantes documentos de la evolución de nuestra cinematografía.

La conservación y preservación de películas es una labor muy costosa. Para la preservación pasiva que es la política sustantiva del Archivo se debe contar con depósitos climatizados. Para cuya obtención en este momento la Biblioteca Nacional concreta negociaciones, para compartir con la Cinemateca Nacional un depósito, financiando parte de la climatización de los depósitos y bovedas que tiene construidas la Biblioteca Nacional en su Nueva Sede y que diversos problemas presupuestarios han impedido su realización.
En este momento la biblioteca cuenta con un depósito para películas cuya temperatura es de 20ºC + 0° - 2º y una humedad relativa de 65% + 0 - 10% lo que no es un parametro optimo. Además de tener un considerable número de films, 60% de ellos en blanco y negro a temperatura ambiente, y tres depositos para video con temperatura y humedad similar a la ya mencionada.

## Los materiales de nitrato fueron separados de la colección

El Archivo cuenta con unas 93 mil piezas (31 mil videocassettes y 62 mil bobinas de películas), que reunen aproximadamente unos 45 mil títulos que cubren nuestra historia contemporánea desde 1923 hasta 1995, fechas del más antiguo y más reciente documento en las coleciones de imagen en movimiento.

Las políticas para garantizar la preservación de este acervo surgen con la creación del Archivo en 1978, que es al mismo tiempo cuando se comenzaron a recibir películas de la Oficina Central de Información, de la extinta Dirección de Cine de la Presidencia de la República y luego del Ministerio de Educación y otras oficinas gubernamentales; ya que la Ley que creó al Archivo, creó también la obligación de que le sea entregada la producción Audiovisual de los entes estatales para su preservación.
Contamos además con la infraestructura adecuada de mobiliario, equipos, espacio y personal capacitado para examinar y catalogar las películas videos.

Nuestras políticas más resaltantes en cuanto al rescate y formación de colecciones, son: todo material sea cual fuese su vía de ingreso: donación, Depósito Legal o compra, debe ser revisado y emitir un diagnóstico del estado de conservación a su ingreso al depósito dándose recomendaciones para su tratamiento.

En la formación de las colecciones tienen prioridad los materiales Venezolanos y Venezonalistas sin que ello signifique la no recepción de películas extranjeras.
La colección está dividida en cinco grandes bloques: Cine Venezolano, Cine Institucional, Noticieros, Cuñas Comerciales y Cine Extranjero.
Los materiales de nitrato fueron separados de la colección y almacenados fuera de la Institución, para ello realizamos un Convenio de Almacenamiento con los Laboratorios Bolivar Films que cuentan con un depósito de nitratos en las afueras de la ciudad.

Los materiales para poder estar en estantería deben en lo posible estar :

a) revisadas en mesa y sustituidos empates o elementos nocivos;

b) haber sido lavadas con ultrasonido;

c) reenvasadas en lo posible, debilmente nucleadas; por ningún motivo se reenvasaran películas con reeles;

d) debidamente identificadas.

## Nuestra preservación es básicamente pasiva

Una vez realizado este procedimiento las películas son catalogadas siguíendo las reglas de catalogación angloamericanas, 2° edición capitulos 1 y 7, utilizando el nivel II de descripción. Una vez que el material ha sido identificado y lavado no se puede manipular, excepto que sea solicitado para su pase a video.

Nuestra preservación es basicamentae pasiva:
El material es monitoreado constantemente y en forma periódica se revisa que los rollos de películas no presenten el llamado "sindrome de vinagre", esporas de hongos, polvo, insectos y otros elementos.
Todo material que presente sindrome de avinagramiento es separado de la colección. El material se lava con ultrasonido, de ser necesario al menos una vez al año.
Ningún material puede ser manipulado, revisado o extraido del depósito a excepción del segmento de la colección sobre el que se este realizando control, lavado, revisión y otro.
Constantemente se mantiene control sobre la temperatura y humedad relativa alertando a los funcionarios de quienes dependen el control ambiental, si se producen cambios.

En cuanto a la parte activa de la preservación: todo el material de nitrato es transferido a material de seguridad.
Todo material que presenta sindrome de avinagramiento esta siendo matrizado, actuando siempre en base a prioridades.
Además toda película cuyo valor documental o testimonial se considere relevante debe ser matrizada.
La Biblioteca Nacional ha suscrito convenios con los laboratoríos Bolivar Films para duplicación de nitrato, y con el Departamento de Cine de la Universidad de Los Andes para duplicar películas en proceso de avinagramiento.

## A partir de 1996 se implementó un programa de duplicación mediante

Toda película copiada, duplicada o matrizada pasa por el Laboratorio de Quimica Analítica, donde se le realiza la prueba de azul de metileno para comprobar si se ajusta a las normas ANSI.
El acceso a las obras sólo será posible en video ya que se considera al material cinematográfico de "conservación absoluta".
Las copías o duplicados de materiales cinematográficos solo se realizan con autorización escrita del Autor.

La Biblioteca Nacional se reserva el derecho de poder divulgar las obras en video dentro de sus instalaciones y de la Red de Bibliotecas Públicas para fines culturales y educativos.

En cuanto al video un 20% del material cuenta con dos copías, una para uso de usuarios y una como duplicado, siendo éste el material de mayor uso. A partir de 1996 se implementó un programa de duplicación mediante el cual se hace un tercer ejemplar para futuras copías. Como

es comprensible esto genera una cantidad de costos que no fueron estimados en la misma medida en que se recibieron las obras y creció la colección, que cuenta con formatos de 1/2 plg y 3/4 plg. Se inició la duplicación con material venezolano y documental para luego pasar a las colecciones de gestión de estado. Para este programa se tiene previsto también elaborar copías de películas extranjeras que ingresaron por Depósito legal, previa selección hecha con criterios de antiguedad e importancia técnica, autoral o temática.

Para 1997 el Archivo Audiovisual de Venezuela tiene pautado duplicar las colecciones de video que ha pautado dentro de sus posibilidades y limitaciones, igualmente continuar duplicando el material avinagrado de cine. Concretar la mudanza de las colecciones a un deposito climatizado adecuadamente y siguiendo los parámetros y recomendaciones previamente establecidos para los diferentes tipos de materiales.

Other addresses of institutions responsible for the preservation of audiovisual archives in Latin America:

*México, Filmoteca de la Unam*
*San Ildefonso 43, Centro, 06020 México, DF., México*
*Tel.: (52-5) 704-3700 - Fax: (52-5) 702-4503*
*e-mail: trujillo@servidor.unam.mx*

*Mr. Iván Trujillo Bolio, Director General*
*Mr. Francisco Gaytan, Preservation*
*Mr. Francisco Ohem, Cataloguing and Programming*
*Language: English/French*

*Uruguay, Cinemateca Uruguaya*
*Casilla 1170, Montevideo, Uruguay*
*Street address: Lorenzo Carnelli 1311, 11200 Montevideo, Uruguay*
*Tel.: (598-2) 48 2460/49 5795 - Fax: (598-2) 49 4572*
*e-mail: cinemuy@chasque.Apc.org*

*Mr. Manuel Martínez Carril, Director / Coordinator*
*Mr. Luis Elbert, Deputy Director*
*Ms Cristina Ferrari, Secretary of coordination*
*Mr. Enrique Gubitosi, Films Archive*
*Mr. Eduardo Correa, Documentation*
*Languages : Spanish/French/English*

*Puerto Rico, Archivo de imagenes en movimiento / Archivo General de Puerto Rico*
*Apartado Postal 4184, San Juan de Puerto Rico*
*Street Address: Av. Ponce de León, 500, Puerta de Tierra,*
*00901 Puerto Rico*
*Tel.: (1-809) 722-2113/722 0331 - Fax: (1-809) 722 9097*

*Ms. Nelly V. Cruz Rodríguez, Director*
*Language: Spanish/English*

*Brasil, Cinemateca Brasileira*
*Largo Senador Raul Cardoso 207,*

*São Paulo, Brasil 04021-070*
*Tel.: (55-11) 575 9264/ (dir) 5084 2177 / 5084 2153*
*Fax: (55-11) 5084 2318*

*Mr. Thomaz Farkas, President of the Council*
*Ms Maria Rita Galvão, Vice-President of the Council, Documentation*
*Ms Tania Savietto, Executive Director*
*Mr. Carlos Roberto de Souza, Preservation and Cataloguing*
*Languages: French/English/Spanish/Italian*

*Perú, Filmoteca de Lima / Museo de arte de Edubanco*
*Paseo Colón 125, Lima 1, Pérú*
*Tel.: (51-1) 423 4732/423 5149- Fax: (51-1) 437 8066*
*(Att. I. León Frías, Ciencias de la Comunicación)*
*(51-1) 423 6332 (Horario nocturno)*

*Mr. Isaac León Frías, Director*
*Language: English/French/Español*

## Preservation des oeuvres cinèmatographiques au Venezuela

Au Venezuela les trois institutions principales chargées de la conservation des archives audiovisuelles sont la Bibliothèque Nationale, la Cinémathèque Nationale et les Films Bolivar.

Des négociations sont en cours entre la Bibliothèque Nationale et la Cinémathèque Nationale pour obtenir des magasins climatisés communs aux deux institutions.

La Bibliothèque Nationale pratique une politique de conservation passive mais a aussi recours à la restauration. La loi sur le dépôt légal des archives audiovisuelles a été votée en 1978, parallèlement à la création du Département des archives audiovisuelles.

Chaque document qui arrive à la bibliothèque, par dépôt légal, don ou acquisition, fait l'objet d'un diagnostic. Les documents à base de nitrate sont conservés en dehors de la ville avant d'être transférés sur un support stable chimiquement.

Une fois identifiés et nettoyées (on vérifie qu'il ne sont pas atteints du syndrome du vinaigre), tous les documents sont catalogués. Ensuite, il est interdit de les manipuler. Les magasins sont régulièrement inspectés pour détecter la présence de microorganismes, insectes.

Le laboratoire analytique effectue les opérations de duplication. On réalise une copie de communication et une de reproduction. Une troisième copie de conservation est systématiquement réalisée depuis 1996.

## The preservation of video carriers at the national library of Venezuela

In Venezuela, the preservation of audiovisual archives is undertaken by the National Library, the National Film Library and Bolivar Films Ltd.

Negotiations are underway between the National Library and the Film Archives to have common air-conditioned storage areas.

The National Library relies mostly on passive conservation but also practises piecemeal restoration. The Department of Audiovisual Archives was created in 1978, together with the law of the legal deposit of archives.

Each document entering the library, be it through legal deposit, donation or purchase is diagnosed for preservation. Nitrate-based documents are preserved in separate areas, outside the city, before being transfered onto more stable carriers.

Once they are identified and cleaned, all documents are then catalogued. Afterwards it is strictly forbidden to handle them.

Storage areas are inspected regularly to detect microorganisms, insects and other pests. Deteriorated carriers are analyzed by the Analytical laboratory where two copies are made. A third copy has been made systematically since 1996.

Alvaro Di Marco
Archivo Audiovisual de Venezuela