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Archival Products NEWS

A Project Embracing Digital Media Preservation: Tradition Becoming Less Traditional

by Kate Contakos and Melitte Buchman

PRESERVATION PRACTICES CONTINUE to evolve, providing more ways in which to preserve. As digital technologies become more pervasive in every aspect of our lives, the physical world continues to be ever present—the coexistence finds a place. As custodians of information, librarians must preserve what is possible, by all measures necessary. The newest challenge for preservation comes in the format of digitally born materials, which tend to be more elusive than paper and books requiring preservation. It is safe to state that the technical aspects of preserving paper are well established. This is not to say that challenges do not come up from time to time, but as a whole, we have guidelines, standards, policies and documentation of how to preserve paper; procuring the funds to preserve is often the obstacle. This challenge is decades old but all new processes pose new questions and problems and digital preservation poses them more complicatedly. Preservation of digitally born materials is the challenge of the 21st century.

Astrid Hadad performing in *Amores pelos.*

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The role of the preservation librarian seems to expand at each twist and turn of the digital degradation process. In many institutions the preservation of digital materials has lagged behind the acquisition; collecting is easier than preserving. Since standards do not yet exist nationally, the need for each institution to establish its

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own standards and policies is of grave importance. This is an added step, on many levels, but it is a step that the preservation community must demand both technically and politically.

At New York University Libraries (NYU), the preservation department continues to practice traditional preservation in commercial binding, reformatting, mass deacidification and conservation. However, new dimensions added over the last few years now include media preservation and the founding of a masters program in Moving Image Archiving and Preservation at the Tisch School of the Arts, participation in the digitally born journal LOCKSS program and other various digital preservation projects such as the Afghanistan Digital Library Project and the Hemispheric Institute of Performance and Politics project. The latter is a cutting edge project that pushes the boundaries of traditional preservation and gives hope for the future for preserving audio and video materials at New York University Libraries.

The Hemispheric Institute of Performance and Politics, NYU's graduate program in performance studies, is creating an archive of performances, lectures and symposia. Most of the archive exists on a variety of audio/video tape formats including miniDVs, VHS and HI-8. An access website was built for some of the multimedia assets, but it quickly became apparent to Diana Taylor, the Chair of the Department of Performance Studies, that the material represented an important and core asset to her department. The Digital Library Team (DLT) at Bobst Library was asked to develop and build both access and preservation for these ephemeral and at-risk materials.

The DLT takes the same approach to preserving multimedia material as it does to physical objects being digitized. Preservation is employed, but nothing invasive is done and the signal is saved un-manipulated and unrestored. This differs significantly from the "restoration" model, but aligns nicely with archiving and library models. Although there are many ways of creating access to video materials, preserving the video signal is quite rare. One of the difficulties in preserving the standard definition video stream (SD) is that it is very large. One hour of miniDV translates into roughly 100GB; one hour of HD signal is nearly twice that. Although server space continues to become less expensive, it is still not economically feasible to save a great deal of video on servers. NYU will digitize, preserve and create access copies for 500 hours of material in the next two years. This is a significant task because each hour of video takes approximately 10 hours of processing.

Developing preservation-worthy workflow is a consuming process. Due to the storage issues mentioned above, the SD signal, in essence the "master," is transferred to digital betacam tape. Some assets already have digital signal, as in the case of miniDV. In this case, a direct transfer of the original signal to the more stable tape is possible. This creation is advantageous because an exact replica, indistinguishable from the source signal and the master signal, is created. Another advantage of the digital

Astrid Hadad performing in *Amores pelos.*

betacam tape is that it can hold up to a 10-bit uncompressed 4:2:2 signal. The 4:2:2 means that the information on brightness is kept in its entirety and that the color channels are reduced by half. None of the materials in the Hemispheric Institute collection exceed this size of video signal. In fact, few assets commonly collected in archives and libraries today are larger than 10-bit uncompressed 4:2:2 and are often, like miniDVs, smaller. An easy analogy is to think of the digital betacam tape as a gallon container that needs to hold a quart of video signal.

As the SD signal comes off of the original, it is reviewed in real time by a technician for technical flaws. We create a condition report for each audio-visual signal. To continue documentation of the SD signal we put 100% bars and tone on the head of each tape for further calibration. At the beginning of each tape the catalog number serves as a title. This is similar to traditional microfilming which includes the targeting and catalog information at the head of the tape.

Once the SD signal is on the digital betacam tape, it is pulled into the virtual environment on a Mac G5, using Final Cut Pro to capture the signal. The master tape is then catalogued and sent off-site for appropriate storage. In the proper climate-controlled environment, these master tapes will preserve the signal for at least 30 years; within that timeframe, the cost of storage will fall sufficiently for us to pull the signal off of physical media entirely. The goal is that final storage of the signal will be on a permanently dedicated server featuring redundancy and failover systems. Failover systems, in the event of energy failure, are sufficiently powered to push all of the information to another daisy-chained server in a different location. The servers are also backed up on tape, as matter of course. The tapes are distributed to various locations for long-term preservation, emulating the Stanford LOCKSS program's mantra "Lots of Copies Keep Stuff Safe."[1]

Many of the original miniDVs and videos were stored in tropical climates in closets, attics and under beds. The Digital Library Team is confident that by making master tapes and storing them appropriately we are preserving the Hemispheric Institute's core curriculum for the future, which is a far better solution than retaining the originals. Also, the original tapes will often go back to the artists who made them with no guarantee of their ability to store the source material properly, so potentially the only copy of the signal will be at NYU.

Access copies are made from the duplicated signal now residing on the G5. Two different types of access copies are made. Both involve compression and both are seen only as access copies. The first are mpeg2s that are made into playable DVDs. Two DVDs are made of each tape. One is catalogued and sent to the Avery Fisher Center for Music and Media at New York University's Bobst Library where patrons can view the DVD. The other is returned to the Hemispheric Institute for gifting back to the artist or for the Hemispheric Institute's own collection. By providing the artist with a DVD, we hope to extend the

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lifetime of their access to their own performances.

The second set of access copies is made as streamable mpeg4s; one copy is for modem use and the other is less clunky for fast cable use. These assets are attached directly to the catalog record. This decision was also made with an eye to sustainability. The DLT is moving away from the idea of attaching files to project-specific websites that may, in the long run, be too expensive to maintain or may become dead links. We provide content for web creators but we attach files directly to the catalog record as well. We are certain that the catalog will always be maintained and that access to the streaming files will therefore be sustained.

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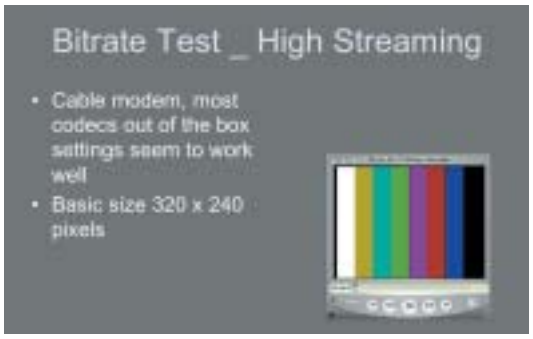
Metadata, or data about data, is a final and critical key to digital preservation. At NYU, data is kept about the technical nature of the tape, the creation environment (including all hardware and software) and any additional information that provides the assets with a digital provenance and history. Digital provenance is not significantly different than the provenance of an object, such as a painting. The importance of understanding both the history of the file and the environment in which it was created is the same for a digital object as any other. The Library of Congress, in partnership with the NISO is developing an XML schema for a set of technical data elements required to manage digital image collections.[2]

As a collaborative preservation and digital preservation effort, the Hemispheric Institute of Performance and Politics project shows much potential for future digitally born materials to be preserved. Preservation awareness permeates everywhere and touches all aspects of the information that libraries must provide access to and preserve. This project of preserving information digitally is a step closer to knowing that preservation is an integral part of all formats of information and that the future holds ever more challenges for the stewards of information.

Processing interview with Astrid Hadad.

De-interlacing test for video.



Bitrate test for fast cable streaming.

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1 http://lockss.stanford.edu/
2 http://www.loc.gov/standards/mix/

My Battles with Mold

by Andrew Damico

Introduction

WHEN PEOPLE THINK OF New Orleans, they think of Mardi Gras, Jazz Fest, Commanders Palace and Emeril's. Food and celebration—that's New Orleans! No other place in this country is quite like it. However, there is one other thing that New Orleans may not be famous for, but surely has an abundance of, and that's mold!

Mold thrives on the warm moist air that is predominant in New Orleans and the Gulf Coast year round. Mold spores are everywhere, so they can strike anywhere at any time with no warning at all. It can strike when you feel you have optimal conditions, and of course, when you have poor conditions. Curiously, it also may not strike when conditions are poor. Although this may not be considered a mold bloom or outbreak, it still is a level of mold that must be dealt with.

Outlined below are three specific examples of how I have dealt with mold, which take into account the above three scenarios. In addition to these examples, I receive numerous e-mails and phone calls on an almost daily basis concerning mold.

Meade Library

Approximately 14 miles south of New Orleans in Belle Chase, Louisiana, Meade Library is located in building A-29. It is one of many former bunkers on this former Army depot, now called the F. Edward Hebert Research Center. Two-thirds of the building has been renovated, with only the library portion having a heating, ventilation, air conditioning (HVAC) system installed. Also in this area are restrooms, a conference room used as storage for books and an exhibit of Japanese artifacts. These areas do not have air conditioning. The other one-third of the building is a storage area of natural sciences containing specimens, old refrigerators and fishing tackle among other things. The windows are constantly open, as testified by the hundreds of mud dauber nests that line the ceiling.

Building A-29. The Meade Library is located in this former bunker.

The interior of Meade is well lit and clean. However, the smell of mildew strongly permeates the area.

The Meade library contains more than 700 journals in the aquatic and natural sciences. The journals in the collection come from more than 50 countries. Only a few of the items in the Meade collection are listed in the library's online catalog. The library mainly has one person using the collection—a professor emeritus, but there are some inter-library loan requests for materials. For the most part, the library is well lit and clean. However, when you walk into the building, the smell of mildew literally almost knocks you over.

Mold thrives on the warm moist air that is predominant in New Orleans and the Gulf Coast year round. Mold spores are everywhere, so they can strike anywhere at any time with no warning at all.

This is the back area of building A-29. A natural history warehouse including specimens, old refrigerators, fishing tackle, etc.

One of the many results of windows being left open. These Ladybugs are grouping together for warmth.

Several windows were always kept open in other parts of the building.

I found the temperature set at 80°F and the humidity could be felt in the air, although it did not seem too high. I set the thermostat to 72°F and called the facilities personnel to tell them what temperature the building needs to stay at.

The first time I walked into the building, I immediately checked to see what temperature the thermostat was set. As it was the middle of summer and about 96°F outside, it felt nice and cool inside. I found the temperature set at 80°F and the humidity could be felt in the air, although it did not seem too high. I set the thermostat to 72°F and called the facilities personnel to tell them what temperature the building needs to stay at. Inspecting the library area, I noticed there were a lot of bug carcasses on the floor, on the unused shelving and in the windows. I also noticed that one window had a one-inch hole that had not been fixed. Many of the bound journals had discolored bindings and patch stains of where mold once was.

I did not see any active mold, however the mildew smell was particularly strong. One of the more disturbing things was that the only door separating the library from the rest of the non-air conditioned building was one of the hollow wooden doors that are found in older residential homes.

Another room in the renovated area was being used as a storeroom for new books. Piles of boxed books filled the room—many, if not all of them, showing signs of pest damage and littered with bug carcasses. This room also had a window open every time I visited. One of the unique highlights of this building was an exhibit of Japanese cultural artifacts—a tea set, a Kimona, vases and some other clothing. Again, this room was relatively clean and free of the mildew smell. However, it too was separated from the rest of the building by a hollow wooden door.

The next trip back I took along an aspirating psychrometer to get a good reading on the temperature and humidity. The temperature reading was 75°F and the humidity reading was around 65%. I thought the humidity reading might be low enough to try something new. I had been reading about chlorine dioxide and its use in some libraries. I thought since this was an isolated library, I might be able to try the Oxine (AD) Sanitizer that I had also heard about. I used the chlorine dioxide first, hanging approximately 15 of the sachets. I returned three weeks later to notice the mildew smell had somewhat diminished. I then sprayed the Oxine (AD) on the floors and walls and left the building, notifying the one patron who used the collection that he would have

Japanese exhibit in building A-29.

to stay out of the building for a day. Two weeks later, there was no change. After about six weeks, I noticed the sachets had started taking on a lot of water. The humidity was again around 65% and I thought then that it was probably too high to be effective. I gave up the battle at that point, trying instead to have them cleaned and moved. But more important projects needed to take priority.

Recently, Tulane University removed all of the boxed books and cleaned up many of the areas in this building. Unfortunately, some of the windows remain open, so it is still treated as somewhat of a warehouse. The library materials still remain at building A-29 and no cleaning or move is on the horizon. However, neither I nor anyone else has yet to see a mold outbreak in the Meade library.

Math Library

Located in Gibson Hall, the original main administration building on the Tulane campus, the Math Library is situated on the fourth floor in the very front corner of the building. The problem is not that it is located in an old building built in 1894. The problem is that it is in a building renovated to 20th century standards. Buildings of the early 20th century and before were built to breathe in hot and humid New Orleans. The big doors and windows would let in the "cooler" air so that the hotter air would rise and leave the building through the ceilings and then the roof. Most renovations of this nature take into account this trend. When this building was renovated, these escape paths for the air were sealed off creating a moisture trap in the ceiling.

Recently when walking into the room, a black streak could be seen on the ceiling where a crack was leading to one of the vents. The smell of mold/mildew permeated the air and the books on one side of the room had started forming small black dots on the spines. The books in this library have been cleaned three times over the past six to seven years. They have not had problems with the temperature, just the humidity. Dehumidifiers have been tried, since it really is just a large room, but they overflowed because custodial personnel felt that it was not their job to empty the overflow tanks. I tried using chlorine dioxide, but, again, the humidity was too high. Finally, just before the third cleaning, common sense set in. It was decided that dehumidifiers that drain to the outside of the building would be purchased. This, along with a last cleaning, seemed to alleviate the reoccurring mold outbreaks in the Math Library.

Howard-Tilton Memorial Library

Howard-Tilton Memorial Library is the main library of Tulane University. The Library houses nearly 2 million print volumes, more than 7,750 current serials, nearly a million government documents, more than three linear miles of manuscripts, hundreds of thousands of microforms, as well as collections of photographs and recordings. Environmental controls are very important and for the most part, are adequate in the building. The only problem I have monitored is the indoor humidity rising from around 50-55% during the fall through spring months to 70% during the summer months. Facilities personnel have been able to lower the temperature when needed in the building. The dehumidifiers in the HVAC systems are working at the max and have been tweaked as much as possible. Nothing further can be done until a renovation of the building is complete which will supposedly happen within the next three to five years.

The small mold outbreak that happened in this library curiously happened the week before Christmas when the environment in the building was at its best. The temperature was below 70°F, and the humidity hovered

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around 50%. This outbreak, of course, happened over a weekend and was strange in the way it spread. Covering three ranges, there were approximately 130 affected books with at least some mold covering the spines. It was the same pattern throughout these three ranges. There would be one book on a shelf, then another three shelves down and one across the aisle two shelves higher. We still do not know the exact cause.

Our plan of attack was simple—clean all affected books, all books adjacent to the affected books and all shelving within the three ranges affected.

Our plan of attack was simple—clean all affected books, all books adjacent to the affected books and all shelving within the three ranges affected. Cleaning consisted of first setting up a well-ventilated area. There were two fans on low that were not directly blowing on the books. Preservation personnel wore facemasks and gloves. We then vacuumed the books to remove as much of the mold as possible from the cover of the books. After the mold was removed, book covers were wiped with a solution of ethyl alcohol making sure that the book covers were not too wet. After the books were dry, we inspected the inside of the bindings and luckily found no indication of mold on the inside. The books were then returned to the shelves once they were cleaned with the ethyl alcohol solution. No sign of mold has been seen in this area or adjacent areas since the outbreak. If this were a larger outbreak, a professional company would have been called in to clean the books. I usually use as a guideline, anything smaller than 500 volumes can be cleaned in-house and a professional company will be brought in for anything larger than 500 volumes. The actual book cleaning took about one day, while cleaning the stacks took approximately one week.

Conclusion

As one can see, mold is a constant threat in New Orleans. Unfortunately, not everyone who lives or works in the area thinks it can happen to him or her. There are still academic institutions in the state of Louisiana that turn off the air conditioner at night and on the weekends so that they may "save money." The problem lies not with the dedicated people and administrators who man these buildings but the money watchers and major administrators of the institutions who turn a blind eye to the seriousness of this problem. I have always told people who ask me for advice that they need to push the health risks of mold, not just the damage to the collection it is causing. Unfortunately, it is not until the problem is out of hand that administrators of these institutions finally take notice. Education at the higher levels is what is needed most of all. We have to teach institutions that they really are saving money by spending a little now. It is not just the cultural heritage that we are saving but the day-to-day information and possibly lives of the people who work and visit these institutions every day.

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