Alaska State Museums Bulletin 51

April 2012

Contents:

Fungus Among Us: Mold Growth in Museum Environments

By Christa A. Pack, Conservator and former ASM Conservation Intern

"I'm like a fungus; you can't get rid of me."

-Adam Baldwin

(Editors Note: This article has been abridged from an independent study carried out to fulfill one of the requirements of the Additional Concentration in Preventive Conservation offered by the Winterthur/University ofDelawareProgram in Art Conservation. The entire paper can be viewed here: Crista Pack Research Paper)

Introduction

Mold spores are everywhere. It may sound dramatic, but there is no escaping them and there is no way to prevent them from coming into contact with collections. However, there are methods for managing the environment in order to prevent growth from starting and thriving on collections items.

Conservators at the Alaska State Museum (ASM) in Juneau, Alaska recently began a research project to study and document "white stuff" that is commonly found on objects in heritage collections throughout the State of Alaska. The common culprits discovered included salt efflorescence, corrosion, and fatty bloom. However, a few long weapons in the ASM closed storage cabinets were discovered to have an unusual fluffy white substance which had the appearance and characteristics of mold. These objects were comprised of wood, bone, ivory, feather, and stone; and the white substance was found on surfaces of each type of material.

Mold was not initially a suspect on any of these objects, as the collections storage at ASM is kept close to the desired ranges of 50% RH (± 5%) and 70° F (± 3° F). According to the Canadian Conservation Institute's (CCI) "10 Agents of Deterioration" website (2010):

"At 60% RH visible mould growth is possible on some surfaces, but a stable RH at this value is rare, any intermittent period at less than 55% will stop growth" and "[for] clean plant based organic materials: mould rate typically requires 80% -85% RH before mould growth likely at all. E.g., clean textiles, clean paper, clean wood."

Therefore, the finding of mold on ASM objects was perplexing, considering that the guidelines given to museums indicate that mold should not grow at the humidity conditions maintained by the ASM. The white substance appeared at some point while the objects were in ASM storage, because they were noted to be in good condition and without any kind of white substance on them when they came into the collection six years ago. Additionally confusing was the fact that the weapons are stored with other items that do not show any white, fluffy growth.

The question this research aims to answer is then, first and foremost, was the white substance on the ASM artifacts indeed mold? If confirmed to be mold, then what factors caused its growth? To answer this second question a more thorough investigation of mold was conducted. This study on mold also aims to answer questions regarding the physiology of mold, differences between mold species, and to determine if all species can be prevented with current guidelines for environmental control. The anticipation is that the answers to these questions may help refine current storage and environmental parameters. The findings of this research may also be useful to the Alaska State Museum since information gathered about the mold on these ASM artifacts may aid in future conservation treatments.

Experimental

The experimental procedures carried out for this research were performed with the goal of obtaining specific information regarding the types of mold found in collections and, specifically, the type of mold occurring on the objects at the ASM. Samples of mold from each of the affected objects were sent to the research labs at Winterthur for analysis. For comparison, samples were obtained from two storage locations at Winterthur as well. These were selected based on recommendations from staff.

Figure 1: Location of sampling area – blackish/brown accumulation on air vent in Winterthur Silver Study, Collection 1.

The first location chosen was Silver Study Collection I, located on the eighth floor of the Winterthur estate. This location had been monitored by a student during the previous academic year for relative humidity and temperature levels. During the year, a black substance was noticed forming on the air vent beneath the window on the exterior wall (Figure 1). It was suspected to be mold and therefore became a candidate for this study.

The second location was the storage closet located on the third floor of the Winterthur Research Building, just outside of the objects lab. This was suggested by Winterthur objects conservator Bruno Pouliot as an ideal location as it is used to house numerous organic artifacts, is a very small, dark room and has one exterior wall with a covered window. Mr. Pouliot was unsure of the air flow in the room, but it is a moderately trafficked room as it doubles as a space for students to observe objects under ultraviolet radiation. This means there are ample opportunities for the introduction of spores into the room. However, mold growth has not been observed on any of the artifacts in recent history. Sampling this room would provide an idea for the types of spores that can be present in a collections storage area, even when conditions are not met to induce growth.

Sampling

In late September, mold samples were received from the ASM. These came from four affected items that had been accessioned into the collection in 2003 (Figure 2). Each sample was packaged individually and sealed within a small plastic Ziploc bag to prevent outside contamination.

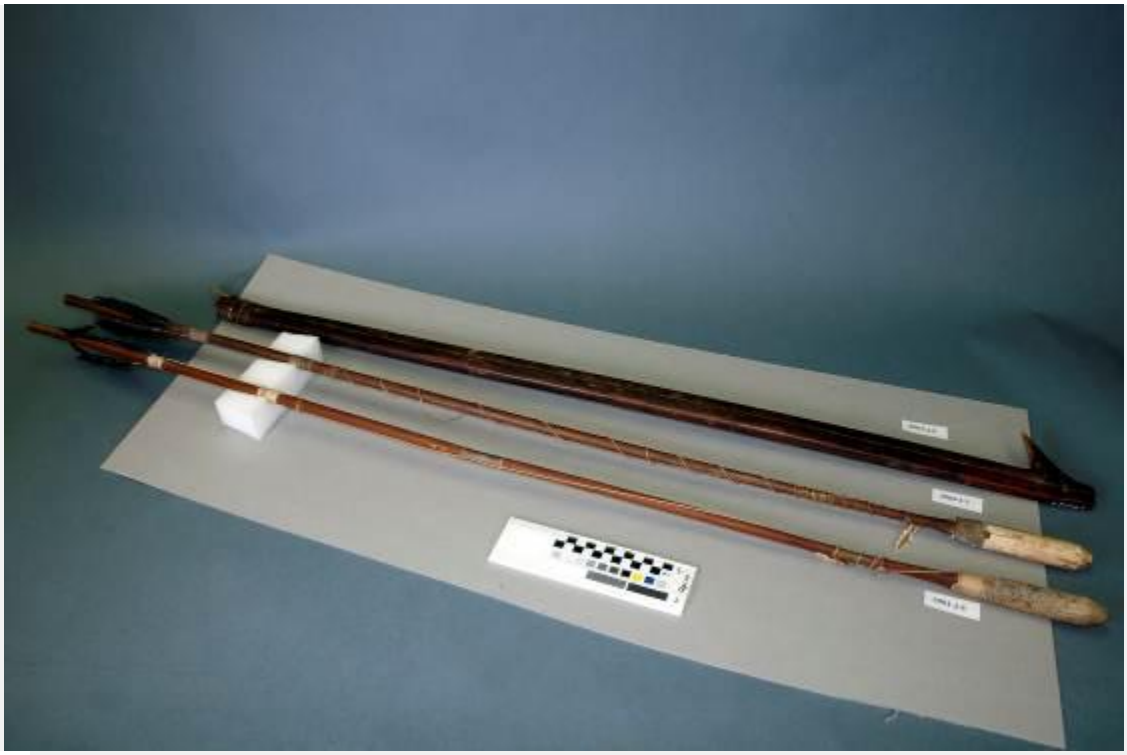


Figure 2: Three of the long weapons on which mold was found. From top to bottom: 2003-3-9, 2003-3-7, 2003-3-8

Within two weeks of receiving the samples, they were transferred to nutritional agar medium for regrowth. The theory was that if samples were transferred to a growth medium, and flourished, then the substance could be more definitively identified as mold. Additionally, if the transferred samples proved to be mold, then the growth medium would provide a way to greatly increase the amount of mold available for study without excessive sampling of the artifact.

Samples from storage spaces at Winterthur were acquired according to advice received from a consulting technician at Ward's Natural Sciences, a supplier for science education. There are two commonly used methods for collecting mold samples: by rolling a sterile cotton swab over surfaces to be tested and then rolling those over the agar, or to leave a plate of agar open overnight in the center of the room to being studied. Both methods were utilized in this study.

For the purposes of this paper, an overall sample was desired that would provide an idea for what type of airborne fungi would be present in a museum storage environment. Therefore, a plate of agar was placed in each of the storage rooms being studied. These were left in place overnight while the museum was closed to visitors (approximately 15 hours). This method provided the best opportunity to determine what spores are naturally present in the room without risking contamination from museum guests. Due to the concern of a mold presence on the vent in the Silver Study room, additional samples were taken from the area where the black substance was visible.

Materials and Techniques

Mold spores can be found everywhere and the small amounts present on the ASM and Winterthur samples were not considered a threat. Nevertheless, strict precautions were taken to ensure people and objects in the lab would not be unnecessarily exposed. All work was performed in a fume hood set at the lowest setting. This was done to prevent spores from escaping into the environment, as well as to ensure that the suction was not too high to lose samples.

Before beginning the experiment, the fume hood was emptied of all items and cleaned thoroughly with a 1:1 acetone: ethanol solution to remove any contaminants. The samples were removed from their Ziploc bags and the samples transferred with the aid of clean stainless steel tweezers and/or clean cotton swabs. The agar medium chosen for this project was a sabouraud dextrose agar. Two samples were placed in each petri dish (Figure 3) and closed and sealed with Parafilm®M. All of the dishes were then placed inside a larger Ziploc bag and left in the fume hood for approximately 3 weeks.

Figure 3: Example of petri dish with two samples – 2003-3-6 on the left and 2003-3-7 on the right. Nutrient media: sabouraud dextrose agar. Sealed along edges with Parafilm® M.

After one week small circles of mold growth began to form in the petri dishes. Within two weeks these circles had spread and formed distinguishable patterns (Figure 4 and Table 2).

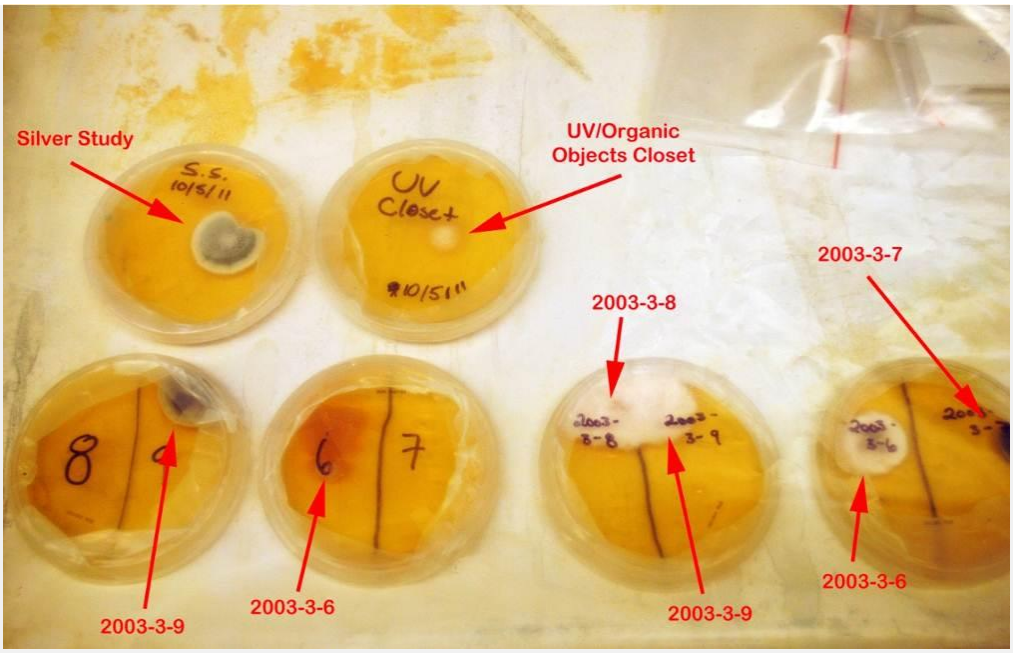


Figure 4: Agar plates with transferred samples, after eight days.

Table 2

Macroscopic Observation of Mold Growth

Sample Number	Observations after 1.5 weeks of growth
2003-3-6	Fluffy white circle with dark green center
2003-3-7	Dark greenish black, oval shaped, doesn't have a "fluffy" appearance
2003-3-8	2003-3-8 and 2003-3-9 appear to have grown into each other. Large fluffy white mass with a slight light pink hue. Not symmetrical in shape.
2003-3-9	
6[a]	Large dark pink area, flat, not fluffy, somewhat symmetrical circles that have grown into each other
7[a]	No visible growth
8[a]	No visible growth

9[a]	White fluffy growth at edges – dark bluish green center. Symmetrical, although grown into side of petri dish.
Silver Study	Concentric circles, nearly symmetrical, fluffy white on outer edge and middle, dark bluish-green in center
UV Closet	Symmetrical circular fluffy white growth

Sample "6" is a second, separate sample, taken from object # 2003-3-6. Sample "7" is from #2003-3-7, "8" from #2003-3-8, and "9" from 2003-3-9. The exact locations for these samples are unknown, but where taken from areas of heaviest accumulation to ensure large enough samples were acquired.

Results

After three weeks, most of the molds had filled the petri dishes and samples were running into each other. Samples were then regrown and analyzed by Nancy Gregory, Plant Diagnostician at the University of Delaware (UD). She transferred each unique sample to its own plate and utilized two different types of agar medium: potato dextrose agar and corn meal dextrose peptone. These had generally proven successful in the UD labs and had produced good results with most types of indoor molds. A few of the ASM samples did not respond in these nutrient mediums. A different agar was tried with these – carnation leaf agar. The results of these new cultures have not yet been determined.

For many of the samples, Ms. Gregory was able to determine the mold down to the genus. The results of her findings are listed in Tables 3 and 4.

Table 3

Genus of Mold Cultures from Alaska State Museum

2003-3-6	*Chaetomium sp.*
2003-3-7	*Aspergillus sp.*
2003-3-8	*Fusarium sp.* Transferred to carnation leaf agar
2003-3-9	*Fusarium sp.* Transferred to carnation leaf agar
6	Bacteria
7	No Growth

8	*Aspergillus sp.*
9	*Aspergillus sp.*

Table 4

Genus of Mold Cultures from Winterthur

Organic Object Closet	Not determined: transferred to carnation leaf agar
Silver Study, Room Sample	*Sclerotinia*
Silver Study, Swab Sample	*Memnoniella sp.*

The genera identified in these tables will be discussed and examined more carefully in relationship the overall taxonomy of the Kingdom Fungi.

The Fungus Among Us

The genera identified from the ASM collections items (Table 3) fall into these two orders of Sordariales and Eurotiales. The Chaetomium sp. discussed in relation to the order Sordariales was identified in sample 2003-3-6 and is characterized by darkly pigmented ascomata, which appear as the dark greenish center in middle of a dense mass of white, fluffy hyphae (visible in Figure 6). Colonies are medium-fast growing in an optimum temperature of 16—25 °C (60.8—77 °F) (Crous et al. 2009, 49).

Figure 6: Chaetomium sp. – darker pigmented area in center is likely from the ascomata

Fusarium sp. (Figure 7) is a genus belonging to the order Euortiales and was identified in samples 2003-3-8 and 2003-3-9. It is commonly found in soil or on plants, but has also been reported on items such as watercolors, old books and parchment, and frescoes in heritage collections (Florian 2002, 25 and Crous et al. 2009, 99). The survivability of this and other genera is impressive. Dried Fusaria have been found to survive up to ten years (in a sealed test tube) and Aspergillus up to 22 years (Florian 2002, 38; after Sussman 1966).

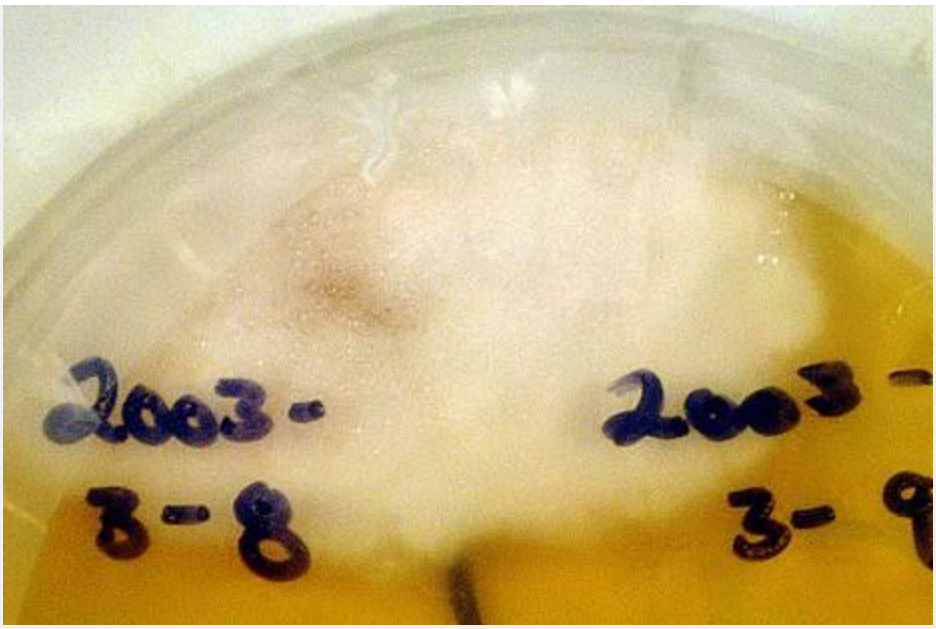


Figure 7: 2003-3-8 and 2003-3-9 – Fusarium sp.

Aspergillus sp. was found in sample 2003-3-7 (Figure 8), and samples numbered 8 and 9 (Figure 9). Some species of Aspergillus are known to produce hard sclerotia that can withstand inhospitable environmental conditions.

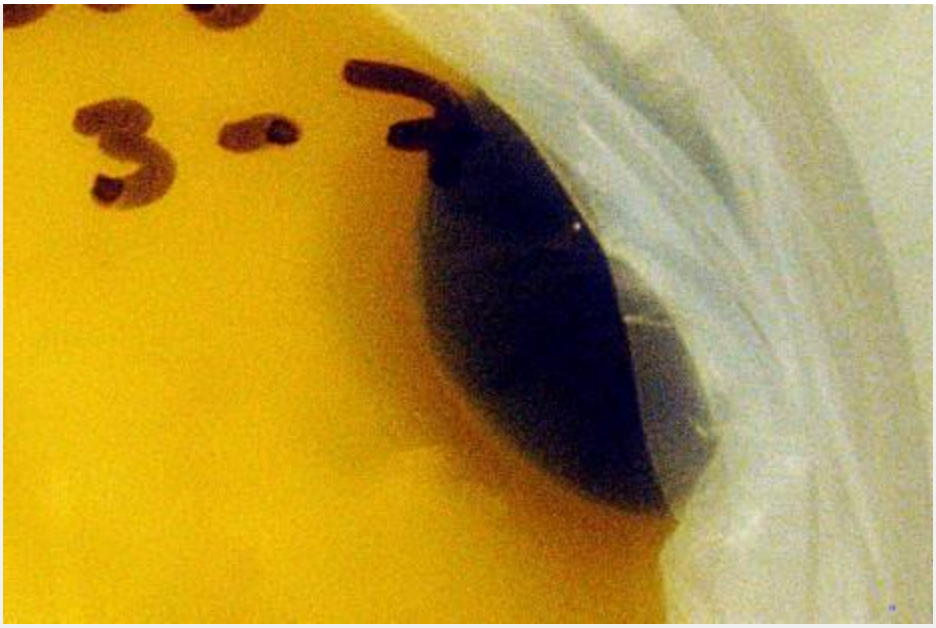


Figure 8: 2003-3-7, Aspergillus sp.

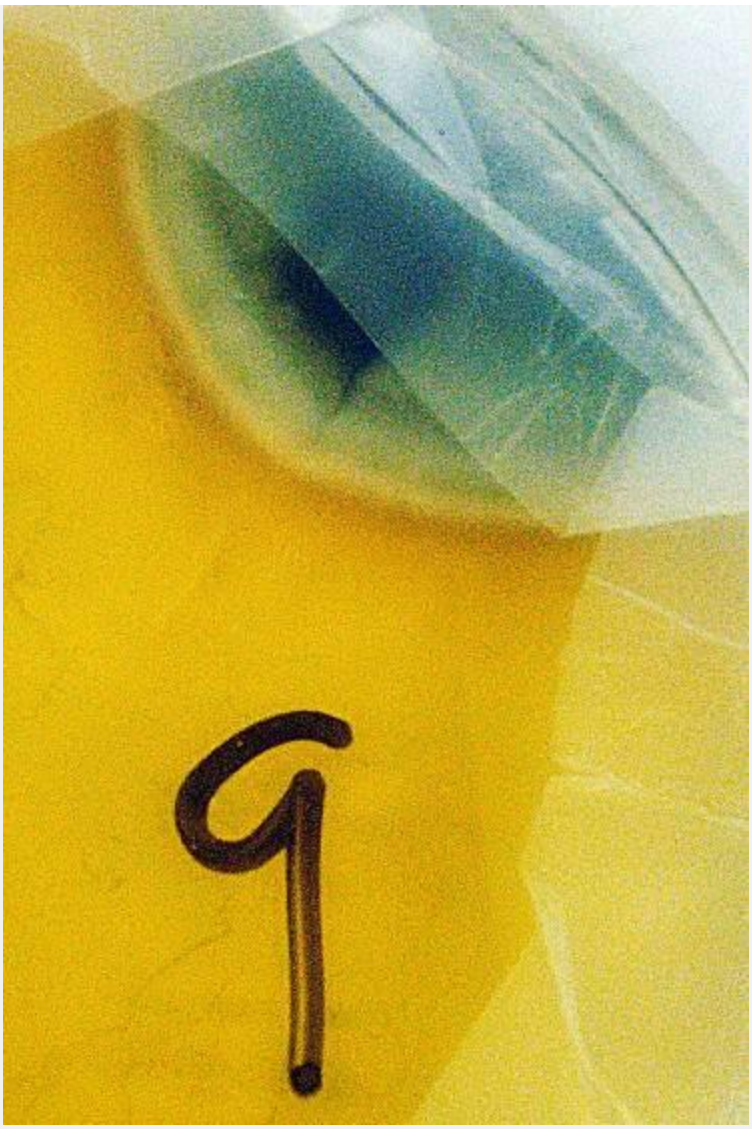


Figure 9: Sample number 9, Aspergillus sp.

These sclerotia are formed from masses of pigmented hyphae and store nutrients for survival. They can be seen within a fungal spot and may look like black fly specks (Florian 2002, 14). If a sample of the fungus can be observed under magnification or with scanning electron microscopy (SEM), the conidia can be examined. In the Aspergillus genus, the conidia cells form on the tip of long, thin erect structures called conidiophores. The conidiophore has a rounded head on which the conidia form; giving the overall structures a hairy look (Figure 10) (Florian 2000, 145).

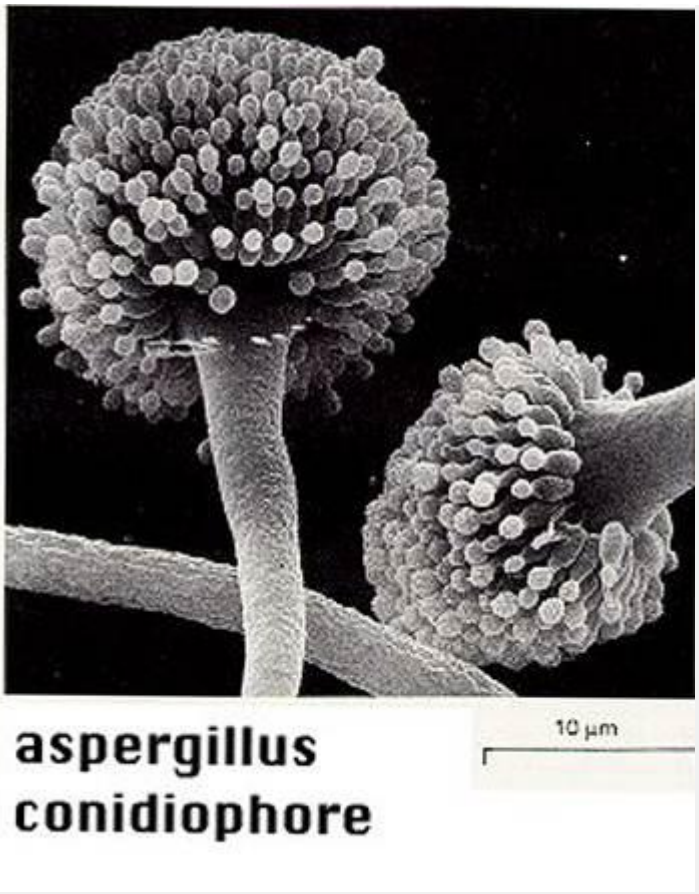


Figure 10: Sample number 9, Aspergillus sp.

Aspergillus is a common airborne mold and is frequently encountered on cultural heritage artifacts, as evidenced in the results obtained from the ASM. Three of the six molds identified from the samples provided by the ASM were Aspergillus.

Common surface fungi such as Aspergillus sp. have been reported in literature to have conidia with a wide range of moisture contents – that is, if they are reported at all. However, there two moisture content groups that dormant conidia are generally believed to fall into: one is low, with a 6—25% moisture content, and the other is higher, at approximately 50—80% moisture content (Florian 2002, 33, 52). Those that fall into the latter category are considered xerophylic (dry-loving) fungi and can germinate even if they are in an environment with a relative humidity below 60% (Florian 2002, 33).

"The ability of the conidium to germinate under low substrate moisture content is attributed to polyols (alcohol sugars) such as glycerol, which are stored in the conidium of the xerophyllic fungus and act as water regulators by storing water. The significance of these xerophylic fungi is that they can germinate unexpectedly on dry materials" (Florian 2002, 33).

The fungi identified from the air samples at Winterthur (Table 4) were not from the same genera as those identified on the ASM objects. Sclerotiniaceae, identified from the air sample in the Silver Study collection is not a commonly identified fungal growth on heritage collections. Rather, it is a genera that is typically associated with fruit and vegetable crop pathogens (Dugan 2006, 63). This is likely a spore that enters into the building through the air handling system or on visitors, but doesn't propagate on the materials within the building.

Memnoniella sp. is an indoor mold that is similar to the genera Stachbotrys - a common in indoor environments in North America (Barnett & Hunter 1998, 88 and Crous et al. 2009, 190). Memnoniella was not

discussed in the literature as a possible threat to collections material. Stachbotrys was mentioned by Florian as having been isolated from wallpaper, as well as old books and parchment (2002, 25).

This small study of the Winterthur spaces suggests that the mold spores getting into the collections areas are not considered a threat to the artifacts. However, this experiment was very limited in scope and many more samples would need to be taken to make any valuable assessment of the air spaces. This also doesn't take into account spores that have already settled on artifacts from previous environments.

Fungal spores that do make their way in can typically survive a variety of environments. The production of spores is often seen as primarily for distribution, but they are also important to the survival of the species. Spores allow the fungi to survive in the form of resistant cells that can withstand environmental conditions not conducive to growth (Blackwell et al. 2009). However, determining the proper environment may be easier said than done.

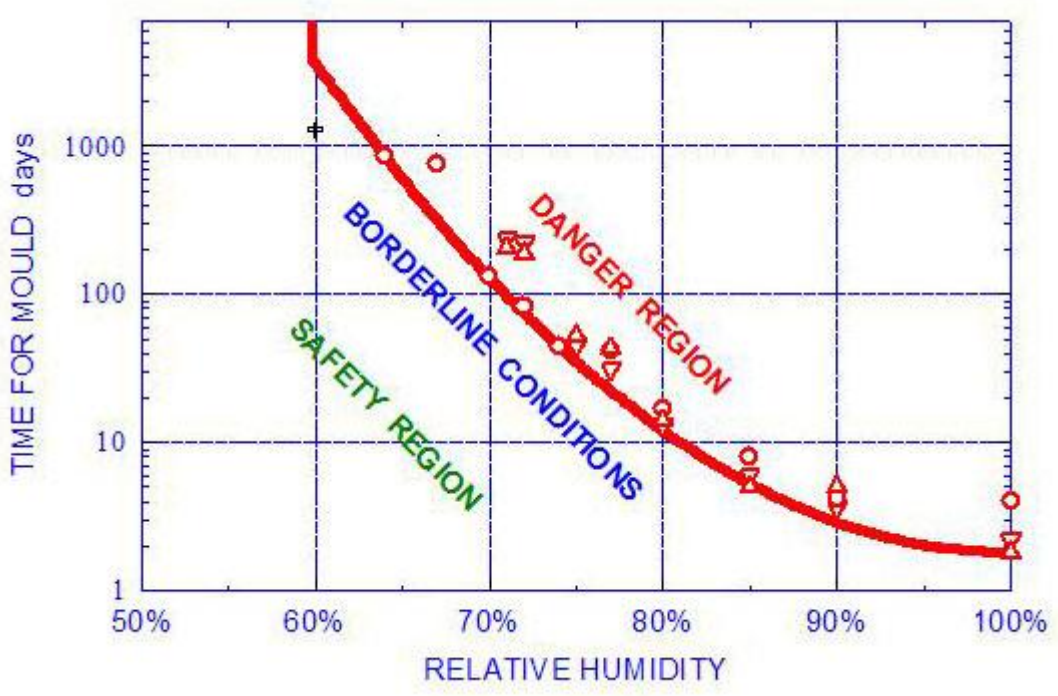


Figure 12: Time to the onset of visible mold at various RH percentages. Graph courtesy of Canadian Conservation Institute: http://www.cci-icc.gc.ca/crc/articles/mcpm/chap10-eng.aspx#toc

CCI states on their website that a minimum of 60% RH is required to start mold growth (Figure 12). Throughout the literature on the subject, most authors publishing environmental parameters do provide values in a range around 60%. However, while there might be a general agreement, the specific RH percentages do differ between sources. Table 1 shows a sampling of conservation resources and the values given.

Table 1			
%RH Data Obtained from Conservation Literature[1],[2]			
Author	Optimal RH% for	Lowest RH% for Growth to	Recommended RH Parameters

	Growth	Occur	
Downey, A. and M. Schobert (2000)	Above 65%	--	--
Florian, M. (2002)[3]	--	--	--
Michalski, S. (CCI, 2010)	--	60%	Below 55%[4]
Nyberg, S. (2002)	Above 70%	45%	45% - 65%
Price, L. (1994)	70% - 75%	--	--
Rekrut, A. (2001)	--	--	Below 65%
Strang, T. and J. Dawson (1991)	Above 65%	--	--
Wellheiser, J. (1992)	65% - 85%	--	--

[1] Each author did not give data for all categories listed in the table. These categories were created to show differences not only in the parameters given, but in how the information is presented.

[2] Data for Price, Rekrut, Strang & Dawson, and Wellheiser was obtained from the Larochette study (Larochette 2003).

[3] Florian does not give specific RH% parameters and instead argues that mold growth is dependent on numerous factors, including temperature, equilibrium moisture content of the artifact, and type of mold. She has nevertheless been included in the chart as a prominent source for fungal research in heritage collections.

[4]Michalski states that any intermittent period at less than 55% will stop mold growth.

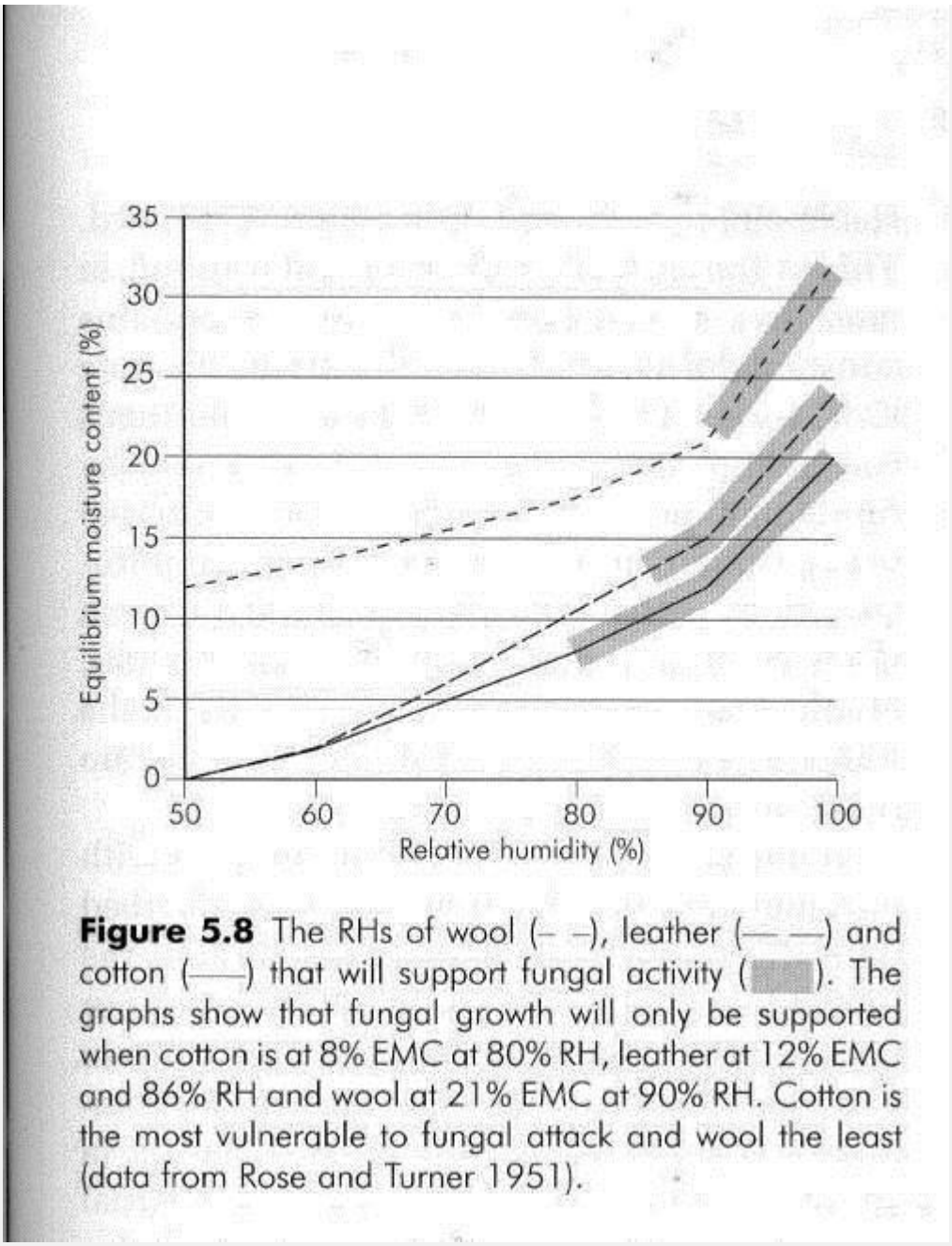


Figure 5.8 The RHs of wool (– –), leather (— —) and cotton (——) that will support fungal activity ( ). The graphs show that fungal growth will only be supported when cotton is at 8% EMC at 80% RH, leather at 12% EMC and 86% RH and wool at 21% EMC at 90% RH. Cotton is the most vulnerable to fungal attack and wool the least (data from Rose and Turner 1951).

Figure 13: Effects of RH and EMC on three different materials – wool, leather and cotton (image: Florian 2002, 51).

Nyberg amends her parameters slightly by emphasizing that while these are the values necessary to instigate growth, the relative humidity needed to sustain growth may be lower (Nyberg 2002, 2-3). However, no specific data is given for what these levels may be.

Florian goes into detail describing the other parameters involved in determining whether conditions will be right for mold growth. This includes temperature, pH, light, oxygen and carbon dioxide in addition to relative humidity and water relationships (Florian 2002, 41). In particular, the effects of temperature and relative humidity together play a crucial role. The equilibrium moisture content (EMC) is an equilibrium reached in an object between water vapor in the air and amount of water in the material. It is affected directly by temperature. If relative humidity remains constant and the air temperature decreases, then water moves into adsorbent organic materials. Likewise, if the air temperature increases, it moves out of the material, drying it,

until diffusion equilibrium is attained with water vapor in the air (Florian 2002, 43). Therefore, an environment maintaining 55% RH in a 70 °F room is going to affect the EMC of materials – and its ability to support mold growth - differently than 55% RH in a 60 °F room.

The material itself that the fungus grows on also plays a major role, as different substrates hold water differently from one another. The chart in Figure 13 shows that when RH and temperature are kept constant, some materials will be more likely to support fungal growth than others.

Conclusions

This research helped to prove that the white substance growing on the ASM artifacts was indeed mold. It also provides a better understanding as to the types of mold that can be commonly found in collections and what conditions are needed for them to grow.

Most surprising is that mold prevention guidelines focus on RH control, while temperature and other factors play an equally important role in fungal growth. The wide range of recommendations for RH parameters in the literature may attest to a misunderstanding of the relationship between relative humidity, equilibrium moisture content and how fungi obtain water necessary for activity. Florian points out that "our choice of lower than 70% RH to control fungal activity is arbitrary. For care of heritage objects, lowering the EMC and RH is the best we can do for now until we can determine their water activity – another avenue for future research" (2002, 54).

Also important is the awareness of xerophyllic conidia that have higher moisture content. These conidia essentially have stored up their own water supply and not only survive but grow in drier conditions. Ultimately, it is the combination of environmental factors, material substrate, and fungal type that determine if mold will grow on a collections item.

The identification of fungal species is difficult and professionals with the experience and specialized knowledge can provide the most useful data in determining the type of mold forming on a collections item. Research that is species specific can provide information as to why fungi are growing on an object and may eventually provide data that pertains to the environmental and material criteria required to sustain growth. However, it does not necessarily influence treatment options. There are very good resources available that address treatment and storage issues for mold-infested items, some of which can be found in the accompanying bibliography. The considerations and options for treatment are numerous and therefore were not included in the scope of this paper.

The research presented here has additional limitations in that samples of the mold were not acquired in situ, directly from the objects. The samples were carefully packaged and sealed for shipping, thereby minimizing the potential for contamination. However, the abundance of fungal spores everywhere means maintaining a sterile environment between the time samples were transferred until they were transferred to agar is highly unlikely.

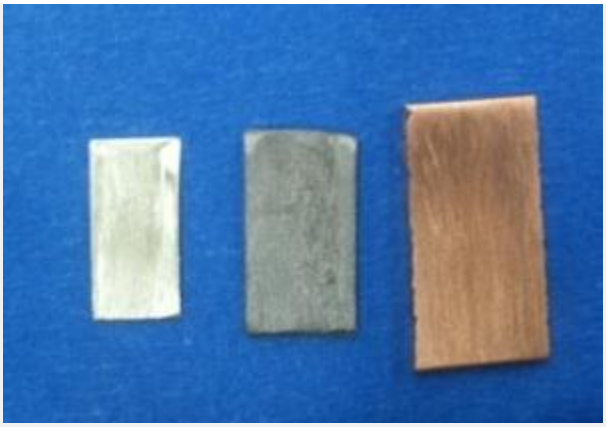
Additional air samples of the storage spaces in Winterthur would provide a more accurate analysis of the type of spores within the museum environment. Also, monitoring RH and temperature fluctuations during the incubation period of the samples of agar would provide more valuable research as to the influence of those conditions on growth. Finally, the observations recorded here were taken at the macroscopic level. Further studies exploring microscopic techniques and analysis would be beneficial, especially since a specialist for mold identification may not always be available.

Ask ASM

Brilliantize is a squirt-on liquid Plexi cleaner, while CRL is an aerosol spray

Question: I just used Plexi cleaner inside this exhibit case. Can I close the case right away, or should I wait to let it air out? Could the Plexi cleaner vapors be hurting the artifacts? Answer quick! The exhibit is opening tonight!

ASM: If in doubt, air it out. But to find out more, we did a little mock up. We placed samples in jars with pieces of polished metal to see if the metal would corrode from pollutants.


Three metal coupons are used in the Oddy test for corrosive pollutants: silver, lead and copper

Museum folks sometimes call this an "Oddy test" http://cool.conservation-us.org/coolaic/jaic/articles/jaic44-03-002_indx.html) after conservation scientist Andrew Oddy, who first pioneered this test at the British Museum in 1973. Rigorous Oddy tests involve controlled laboratory conditions to force a reaction in a short period of time. Ours at the museum are slower and simpler. We have two jars as "controls" to show the difference between a good reaction and a bad reaction. One jar will contain something we know ought to cause trouble, like a freshly sawn piece of low-grade plywood. The other jar represents a good environment, so we just put a piece of clean cotton cloth in the "good" jar. Then we loaded two scraps of cotton cloth with the two different kinds of Plexi cleaners we use. One kind is a liquidy cream that squirts on (brand name Brilliantize), and the other is an aerosol spray (brand name CRL). In each jar we placed three polished coupons of pure

metals: silver, lead, and copper. Each metal is sensitive to many different kinds of pollutants. For example: silver is sensitive to sulfur, copper is sensitive to chlorides, and lead is sensitive to formates. All four jars were left sealed on a shelf for several months. When opened, the appearance of the metals placed with the Plexi cleaner samples was compared with the "good" and "bad" environments. There was no obvious difference in the copper or silver coupons, not even in the "bad" environment with the plywood. This suggests that the volatile chemicals that off gas from plywood is not causing corrosion on copper or silver. But the plywood did cause white powdery corrosion to form on the lead, probably lead formates. That indicated the test was working properly, because we saw damage to the lead that we expected to see.

In the jars with the Plexi cleaners, the silver and copper coupons were also unchanged. Only the lead in the CRL jar was different, and it was much darker than the one in the "good" jar. This suggests that something in the CRL reacted with the lead and darkened its surface, but not the same pollutant we see in the "bad" jar with the plywood. We cannot say what chemical is in CRL just from this test, but we can say there is something in it that was able to alter the lead, and therefore might also be able to alter some of the things our artifacts are made of. The coupons in the jar with the sample of Brilliantize looked exactly like the coupons in the "good" jar, suggesting that there is not enough chemical off gassing from the Brilliantize to alter sensitive surfaces of these three polished metals, and therefore is unlikely to damage our artifacts.

From left to right: lead exposed to plywood has powdery white corrosion, lead exposed to Brilliantize had little change, lead exposed to CRL had a significantly darkened surface, and our lead coupon from the clean jar for comparison.

We recommend using liquid-based Plexi cleaners when you have a time crunch, and letting your exhibit case air out well if you want to use an aerosol-based Plexi cleaner.

Shaking the Money Tree

Alaska State Museums Grant in Aid

Deadline: Postmarked by June 1; email by 4:30 pm AKST June 1.

Applications and more information: http://www.museums.state.ak.us/grants.html

FAIC ANNOUNCES MAY 1 DEADLINE FOR TRU VUE OPTIUM CONSERVATION GRANT

Tru Vue® Inc. has partnered with the Foundation of the American Institute for Conservation of Historic and Artistic Works (FAIC) to offer grants to support projects in glazing applications for preservation of museum and library collections. Funds are to help defray direct project costs, including supplies and publicity. Projects must be supported by a conservator and demonstrate conservation goals. Up to four awards will be made each year. Each award includes a cash amount of up to $4,000 and donated Tru Vue® Optium® acrylic glazing materials. Guidelines and forms are available on both the AIC/FAIC website, www.conservation-us.org/grants and Tru Vue, www.tru-vue.com/museums/grants, or by calling the FAIC office at 202-452-9545.

NEH

Research and Development Program

The revised 2012 guidelines, which include new sample proposal narratives, can be found at: http://neh.gov/grants/guidelines/PARD.html

Deadline for submission: May 16, 2012

Grants in this program support projects that address major challenges in preserving or providing access to humanities collections and resources.

Preservation Assistance Grants for Smaller Institutions

Program information can be found at http://www.neh.gov/grants/guidelines/pag.html

Deadline for Submission May 1, 2012.

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Spotlight on Grant in Aid

Juneau Douglas City Museum Installs Kids' Mining Interactives

The Juneau-Douglas City Museum used their FY2011 Grant in Aid to research, design, build and install an interactive cross-section of the Treadwell Mine cave-in to compliment a completely new installation in the museum's northeast gallery.

Starting in fall of 2010 J-D museum staff de-installed the existing hands-on history exhibit in the northeast gallery and installed a new hands-on exhibit titled: "Drilling & Milling: Hands-on Mining." The project began with the retention of Commercial Signs and Printing (CS&P) a local business, on contract, to research and design an interactive activity based on the collapse of the Treadwell Mine in 1917. Over the course of the Fall, with staff, the interactive was developed and installed. The final product is a 70" x 89" cross section of the Treadwell Mine on the days of the collapse. The model is based on a drawing by Livingstone Wernecke, the mining engineer in charge of investigating the collapse. The interactive includes two windows with 4 sliding panels each. Each of the sliding panels records events from the collapse that occurred above and below ground. Each sliding panel has historic photos, sketches, text, first person quotes and and narrative that illustrates what was happening in and around the mine as it collapsed and flooded.

In-kind grant funds were used for additional contract labor for the Treadwell cave-in model, materials to retrofit the room, and signs and graphic panels to compliment interpretation and reinforce the feeling that visitors are "going underground."

This project has been a great success. It allowed the museum to reinvent and reinterpret one of Juneau-Douglas's most important historic subjects. When visitors walk into the gallery, they get the feeling of entering a mine. There are many activities designed for kids of all ages to teach them about early mining technology through tactile experiences. The Treadwell collapse interactive anchors their experiences in the room through a true story about one of Juneau's most significant historical events. The interactive and the "Hands-on Mining" exhibit improve the museum's ability to serve the community by educating visitors about the history of mining in the Juneau goldbelt.

As the community moves into the future, the Kensington Mine expands and the City and Borough of Juneau explores the potential for re-opening the AJ Mine, this interactive and the exhibit around it will help to educate the public about the history of mining in the region. This project to reintrepret mining technology has allowed the J-D Musum to partner with Greenscreek Hecla, and now AEL&P, who will be helping the museum intrepret hydro-mechanical power and hydro-electrical in a hands-on panel that will be placed directly across from the Treadwell Cave-In Panel.

Conference Review

Sheldon Jackson Museum Participates in the 2012 Clan Conference

The Sheldon Jackson Museum was pleased to be part of the 2012 Clan Conference in Sitka. One of the highlights of the museum's participation at the conference was a visit by descendants of Rudolph Walton's family to see artifacts in the collection that were made by Walton. Walton (1867-1951), one of the first graduates of the Sitka Industrial Training School, was a prolific silversmith and wood worker who owned Walton and Sons Shop in Sitka until 1920. The Sheldon Jackson Museum has thirty-five pieces in the collection that are attributed to Walton including silver spoons, bracelets, tongs and napkin rings, an ivory cribbage board, a model ivory totem pole, and a group of wooden feast dishes. It was a pleasure for staff to meet descendants of Walton's family and to share the museum's Rudolph Walton records and artifacts with them.

Another highlight of the SJ Museum participation at the Clan Conference was the museum's involvement in the Smithsonian artifact scanning project organized by Eric Hollinger, Smithsonian National Museum of Natural History archaeologist and repatriation officer, and his two assistants Adam Metallo, and Carolyn Thome. Hollinger and team documented the helmet using a Faro laser scanner. Such technology creates detailed digital records which can be used to make 3D "prints" of artifacts for educational purposes. Two Sheldon Jackson Museum artifacts were scanned during the clan conference including an example of Haida argillite sculpture, and Katlian's helmet which was worn by the Kiks.adi warrior during a battle with the Russians in Sitka in 1804.

During the conference our museum also hosted a lecture on spruce root basketry by local Tlingit artist Teri Rofkar, and a model doll making class led by Mary Ellen Frank, Lisa Golisek, and Elizabeth Knecht (all from Juneau). The museum also welcomed visiting researchers and scholars who shared some of their expertise with us including Emily Moore, Robin Wright, Katie Bunn-Marcuse, Steve Brown, Peter Corey, and Tina Bruederlin. Thank you to all who stopped by our museum!

Alaska Museums in the News

Old, new worlds meet in Alaska Native artist's work

http://www.alaskadispatch.com/article/old-new-worlds-meet-alaska-native-artists-work

Professional Development/Training Opportunities

ANLAMS Boot Camp Review

by Amy Carney

It was a cold and snowy February in Anchorage, yet twelve hardy souls traversed across the far reaches of Alaska to attend a museum boot camp commandeered by ASM Curator Scott Carrlee. Eager to learn the tricks of the trade in establishing and maintaining a museum, each participant sat around the small conference room of the Alaska State Library building with notebooks open and pens scrawling. Within four days everyone was expected to walk away with the ability to write a mission statement and scope of collections, care for collections, devise a strategic plan, evaluate policies and procedures, initiate a disaster plan, identify archives, and engage their community with their museum.

How was all of this possible? Now you know why it was called “boot camp.” Through the careful planning and orchestration of many museum professionals throughout Alaska, this wealth of information was compacted into several sessions back-to-back led by various guest speakers. Additionally, each participant was gifted with a fabulous flash drive chalk-full of useful forms, PowerPoint slides, and professional contact information. Friday morning there were many tired faces and numb minds, but enthusiasm still ran high.

The sessions I found to be most helpful for my current job were Scott Carrlee’s “Starting Off Right” session and Robyn Dexter’s “Learning About Archival Collections” session and tour at National Archives and Records Administration. Carrlee’s “Starting Off Right” took us through a half day of evaluating mission statements, visions, and collection scopes. Additionally, we learned about what it means to be a museum. The small museum in which I work still has room for progress when it comes to written policies and procedures. I felt that his lecture and workshop helped me focus on what needed to be done at my own work, as well as focus on what is important in museum standards. Dexter’s active discussion about archive collections answered some of my own questions about what archives are, and how they are different from museum objects. As one whom works within a library, museum, and archive setting, this sort of clarification was crucial to me. Her session was very engaging and gave everyone the opportunity to ask in-depth questions.

Overall, I can honestly say that there were no “bad” or dull sessions. I was very happy to have been chosen to attend the boot camp, and I know others were pleased, as well. Alaska has many small museums that are fighting to survive and engage their community with its own history. Additionally, lack of money and resources are a constant hindrance. On top of all the things I learned, I found it to be encouraging to meet other Alaskans from small areas who were dealing with the same issues as I am. Within four days I gained a clearer understanding of small museums, as well as a few new relationships to call upon when I need advice and encouragement. Thank you to all the individuals who put forth a great deal of effort and time to create, facilitate, and present this museum basics class for Alaskan museum workers like me!

Heritage Preservation Announces MayDay Activities

Every year Heritage Preservation encourages libraries, museums, archives, historical societies, and preservation organizations to set aside May 1 to participate in MayDay. This year, make sure your institution is prepared! Any cultural institution submitting a brief description of its 2012 MayDay plans or accomplishments by May 31, 2012, will be entered in a drawing for disaster supplies donated by Gaylord Brothers. Heritage Preservation will also offer its award-winning Field Guide to Emergency Response and Emergency Response and Salvage Wheel at special MayDay prices from April 1 through May 31.

For project ideas, information on prizes, and the book sale, visit Heritage Preservation's MayDay site, http://www.heritagepreservation.org/PROGRAMS/TFlessons/MayDay.html

Also take advantage of the upcoming free webinar, MayDay!: Create a Game Plan, on April 19 from 9 a.m/ to 10 a.m. AKST. Lori Foley, Vice President of Emergency Programs at Heritage Preservation, and LeRae Umfleet, Chief of Collections Management at the North Carolina Department of Cultural Resources, will share ideas, suggestions, and advice on how to do one thing for emergency preparedness. Registration is not required to participate. Learn more at Connecting to Collections at http://www.connectingtocollections.org/featuredresource-mayday/

AASLH's Small Museums Online Community (SMOC)

SMOC has officially launched and is now open to the public. Break out the streamers & confetti! You can use SMOC to connect with museum professionals from around North America, find helpful resources, and discuss topics of importance to the museum community. (Trivial topics are also welcome. The seemingly trivial is often the most profound.) Maggie Marconi, one of the members of AASLH's Small Museums Committee, has written a welcome blog post for SMOC that provides information on how to navigate the site. Check it out here:

http://www.smallmuseumcommunity.org/blog/2012/03/welcome-to-the-small-museums-online-community/

Association for Library Collections and Technical Services (ALCTS)

ALCTS webinar: Preserving Your Personal Digital Photographs.

Date: April 26, 2012 All webinars are one hour in length and begin at 11 a.m. Pacific, noon Mountain, 1 p.m. Central, and 2 p.m. Eastern time.

Description: Digital photos are fragile and require special care to keep them accessible. But preserving any kind of digital information is a new concept that most people have little experience with. Technologies change over time and become obsolete, making it difficult to access older digital photos. And since digital photography results in immediate personal memories, we take and collect an enormous amount of photos. But as our personal collections grow, it becomes more and more difficult to save those photos and to find specific photos. If your digital photos are difficult for you to manage, how will your loved ones be able to make sense of them in

the future? Learn about the nature of the problem and hear about some simple, practical tips and tools to help you keep your digital photos safe.

Learning Outcomes:

1. The nature of the problem

2. Simple practical tips to describe and save digital photos 3. Tools that can be used

Audience: Anyone with an interest in preserving personal digital photos and other digital information.

Presenter: Bill LeFurgy, Digital Initiatives Manager, has worked for the National Digital Information Infrastructure and Preservation Program at the Library of Congress since June 2002. He leads the NDIIPP Communications Team, which interacts with a broad range of people interested in preserving access to digital information. In former lives, LeFurgy dealt with electronic records at the National Archives and Records Administration and served as Baltimore City Archivist and Records Management Officer. While he has memories of punch cards, monochrome monitors, and 30-pound portable computers, he is also an enthusiastic creator and consumer of social media. He has a BA degree in History from McGill University, as well as an MLS and MA in History from the University of Maryland.

Free, but registration is required. This session is available at no cost as part of Preservation Week 2012.

For additional information including technical requirements and how to register, please click on the following link:

http://www.ala.org/alcts/confevents/upcoming/webinar/pres/042612

ALCTS webinars are recorded and registrants receive a link to the recording shortly following the live event.

For questions about registration, contact ALA Registration by calling 1-800-545-2433 and press 5 or email registration@ala.org. For all other questions or comments related to the webinars, contact Julie Reese, ALCTS Events Manager at 1-800-545-2433, ext. 5034 or alctsce@ala.org

IMLS Connecting to Collections

The 2012 Continuing Conversation Online Exchange was designed just for you. These 90-minute webinars are free of charge and will include brief presentations and ample time for conversation and brainstorming with the presenters and your peers from other states. Lively participation is key to the success of these events

Register at http://learningtimesevents.org/c2cexchange

Conducting Meaningful Evaluation: How C2C Statewide Grantees can effectively measure the impact of their program activities

Wednesday, April 25, 10-11:30 am AKST

Featuring:

Scott Carrlee, Curator of Museum Services, Alaska State Museums, Juneau, AK and Alaska C2C Statewide Planning Grant

Christine Reich, Director of Research and Evaluation, Museum of Science, Boston, MA and Chair of American Association of Museums' Committee on Audience Research and Evaluation

Erika N. Feldman, Ph.D., Research Scientist, University of Washington, Seattle, WA

Building Effective and Innovative Partnerships: How C2C Statewide Grants are providing opportunities to strengthen existing relationships and reach out to new groups

Thursday, April 26, 10-11:30 am AKST

Featuring:

Michele Stricker, Assistant Director, Library Development Bureau, New Jersey State Library, Trenton, NJ and New Jersey C2C Statewide Planning Grant

Margaret Mary Layne, Executive Director, Huntington Museum of Art, Huntington, WV and West Virginia C2C Statewide Planning Grant

Randy Silverman, Preservation Librarian, University of Utah Marriott Library, Salt Lake City, UT and Utah C2C Statewide Planning Grant

Professional Time Wasting on the Web

Help Alaska Native Kids Save Their School

http://www.huffingtonpost.com/alaskadispatchcom/help-alaska-native-kids-s_b_1401334.html

Will US Arctic planning take a 'Sputnik moment' as activities increase?

http://www.alaskadispatch.com/article/will-us-arctic-planning-take-sputnik-moment-activities-increase

SÃO PAULO, Brazil — All over the world cultural organizations are tightening their budgets and paring back productions. But Danilo Miranda faces a different challenge, one that makes him the envy of his peers. As the director of the leading arts financing entity in Brazil, his budget is growing by 10 percent or more annually, and he must figure out ways to spend that bounty, which amounts to $600 million a year.

http://www.nytimes.com/2012/03/27/arts/brazils-leading-arts-financing-group-shares-the-wealth.html?_r=1&pagewanted=2&nl=todaysheadlines&emc=edit_th_20120327

Interesting stuff from the IMLS blog site:

Shedding Light on the Oldest Recorded Sounds

http://blog.imls.gov/?p=1094

IMLS on YouTube: MFA Grant Helps Preserve Johnson City Photos

http://blog.imls.gov/?p=1083