Report of the
Preservation–Future Directions Symposium:
Preservation Education in the 21st Century
Library of Congress, Washington, DC
May 15-16, 2008

September 15, 2008

Submitted by:
Dianne van der Reyden
Director, Preservation Directorate
Diane Vogt-O'Connor
Chief, Conservation Division
Karen Motylewski
Special Project Liaison, Institute of Museum and Library Services

Library of Congress
101 Independence Avenue, LM-642
Washington, DC 20540

Table of Contents

Executive Summary

On May 15-16, 2008, with generous funding from the Getty Foundation to the Library of Congress, the Library convened seventy-one invited senior leaders in conservation and preservation education and practice to examine needs, solutions, and priorities for education and training to help support the preservation of documentary library, archival, and museum collections to meet users' needs through the 21st century. Recommendations from two prior symposia of preservation leaders have been integrated into the Library's long-term strategic plans, and the Library is engaged in key discussions concerning preservation and conservation education. The May program was a logical next step in mapping the collections preservation landscape of for the coming decade.

An electronic survey and four themes were provided in advance to shape participant preparation. One focal theme was assigned to each of four pre-assigned small groups, and plenary discussions facilitated additional input. These initial themes can be summarized as: (1) who should be trained as preservation and conservation professionals; (2) what do they need to know; (3) how can we strengthen education and training for this purpose; and (4) how can we better assure resources for tomorrow's preservation needs?

This report sets out to provide an accurate reflection of discussion among key representatives in the field. We believe this is a necessary preliminary to build consensus about future education and training to preserve cultural and informational collections. Discussions were passionate and far ranging within the Symposium's context, and provided rich information for long-term planning. Inevitably, not all of the many questions presented in focal groups were addressed, and solutions were not suggested for all of the many issues or concerns raised. There is no exact correspondence between the observations and solutions reported, although connections are clear. In addition, observations and potential solutions do not necessarily represent consensus among participants or the view of the Library of Congress or its individual staff members.

The following key topics emerged from notes provided by formally assigned Symposium recorders: (1) preservation challenges in the digital age; (2) the expanding nature of preservation and conservation responsibilities; (3) funding, policy, and support for preservation; (4) erosion of conservation treatment skills; (5) internships and post-graduate training; (6) faculty and mechanisms for preservation and conservation education; (7) high-priority content for preservation education; (8) the need for outreach; and (9) diversity in the conservation and preservation professions. Details are provided in each corresponding segment of report section V.

Regarding next steps, this report will be made available on the Library of Congress Preservation Web site (see http://www.loc.gov/preserv/symposia/preseduc.html for a summary report), and disseminated to Symposium participants and the field at large. Responses from the field will be invited to validate and further clarify observations and potential solutions, and to identify consensus (if any) about priorities. The Library continues to seek suggestions for how these priorities might best be met.

Such input is vital, since a key issue for progress is the distribution of responsibility for suggested actions. No one institution can assume all responsibility either for preservation at large or the recommendations made here. That would not be effective strategy for the large-scale and multi-level efforts implied. The Library is currently exploring new sources of funding that might be available to support efforts at the national, regional, or local level. Other institutions, including those represented by Symposium participants, must also play a role. The Library seeks ideas for what these roles might be, and a distributed willingness to take ownership of them.

Addendum (January 2010)

Since this report was written, the University of Texas at Austin School of Information has discontinued its specialized preservation and conservation programs and has revised its Certificate of Advanced Study (CAS) program to permit any student to construct an individually designed CAS (including preservation and/or conservation), based on twelve credit hours (four courses) beyond the MLIS. This may include a broad range of courses relevant to preservation practice in a variety of contexts, and is positioned as an opportunity to better integrate preservation and conservation knowledge and skills in the education of every MLIS graduate.

Details are provided at http://www.ischool.utexas.edu/about/news/view_news_item.php?ID=269 and http://www.ischool.utexas.edu/programs/specializations/#Preservation. Two optional courses in book conservation are included in the new CAS curriculum, but chemistry (considered by most a prerequisite and a foundation for conservation treatment, but not for admission to library and information programs), paper conservation laboratories, and advanced conservation laboratory have all been eliminated. No course on book history will apparently be offered, disadvantaging any CAS graduate interested in meeting the conservation needs of rare or special book collections.

The new CAS in preservation and conservation offers the opportunity to use the twelve credit hours of specialized courses to become conversant with digital libraries and historical museums, as well as with audiovisual and archival materials, and digital preservation, a potential shift towards the growing interest in the development of a context-independent, cross-disciplinary professional specialization in cultural heritage preservation.

The highly experienced prior Director of the University of Texas Kilgarlin Center for Preservation of the Cultural Record will teach as an adjunct for the University of Delaware's highly respected Department of Art Conservation, expanding that program's faculty expertise in library and archives preservation management as well as its expertise in whole collections preservation strategies. The status of the Kilgarlin Center itself is unknown. As of this writing the relevant Web pages are no longer available.

Report of the Preservation–Future Directions Symposium: Preservation Education in the 21st Century Library of Congress, Washington, DC May 15-16, 2008

I. History and Background

In 2004 the first systematic national survey of the condition of collections in US libraries, archives, and museums documented the preservation needs of our cultural and intellectual heritage (www.heritagepreservation.org/HHI/summary.html). Eighty percent of survey respondents, a representative sample of libraries, museums, and archives across the nation, dedicate no paid staff to collections care, and 22% have no staff at all for this important function. Approximately 80% have no plan for, or staff trained to respond to, collections emergencies, whether those are occasioned by small local events or disasters like Hurricane Katrina. Seventy-one percent of institutions report they need additional training and expertise to care for their collections.

These institutions hold at least 4.8 billion items. Libraries alone hold 3 billion items, of which an estimated 1.3 billion are at risk. Archives and museums have hundreds of millions of additional at-risk items. These include traditional books, manuscripts, photographs, prints, and drawings, and other text and art on paper or other materials. These include parchment maps, pith paper paintings, textiles, and other media. They also include images and sound recordings in many film and magnetic tape formats in performing arts, oral history, motion picture, and similar collections. The number of digital formats such as CDs, DVDs, and device drives is rapidly expanding, and formats are rapidly become obsolescent, if not obsolete.

Digital technology offers unparalleled benefits for broad and convenient access, rapid communication, creativity, and even the protection of vulnerable items by limiting their exposure to use. In response, many decision makers, faced with economic constraints, have shifted preservation resources towards creation and protection of digital materials. Compounding the challenge, rapidly changing technology and poorly understood cycles of deterioration have exposed the ephemeral nature of digital media. As a result, strategies for its long-term preservation remain varied and unproven in the long term (as custodial institutions define long term). Our digital age clearly demands radical change in approaches to collections preservation.[1]

Cultural stewards must find effective ways to balance the crucial need for digital preservation and access against the need to address other deteriorating collections, as well as the collections that will serve as the source of future digital resources. Preventive conservation, innovative training approaches, knowledge of a broad range of materials, and multi-cultural stewardship issues must all play roles, as must skills for management, cooperation, and communication. Many models of conservation education and training have focused intently on developing preventive conservation and bench skills to address deterioration (an essential part of the necessary body of skill). In addition, interested students are often drawn to conservation for the development of treatment skills. The historical model of conservation training has strong roots in the care of art objects; the field has found it difficult to attract students representing cultural diversity; and curriculum and practice for digital preservation remain developmental.

[1] There is no consensus for the meaning of the terms preservation and conservation, which the museum and information science fields use differently. Library and archives settings typically use "preservation" as the umbrella term referring to all activities contributing to extend the life or improve the condition of collections; "conservation" indicates activities associated with item or collection treatments. Museum and conservation settings typically use conservation as the umbrella, preferring "preventive conservation" for prophylactic collection activities. This report, originating from the Library of Congress, uses preservation as the primary term, and conservation in the more restricted sense. Although preservation professionals are usually not trained or expected to carry out detailed treatments, they must often be knowledgeable about the options for outsourced treatment programs; conservators, who are trained to perform treatment, are frequently expected to be knowledgeable about the full range of preservation options.

Historical efforts of the Library of Congress since the 1966 Florence flood, combined with the Library's strengths in staff and other resources, make the Library a recognized leader in the network of collections preservation. Efforts since the 2005 hurricane season have brought together preservation leaders from academic training programs, consortia, professional organizations, and funding agencies to consider "Future Directions in Document Preservation," focusing on emergency preparedness and national strategic preservation planning (www.loc.gov/preserv/annual2006/annual2006.pdf). Recommendations from two prior symposia of preservation leaders have been integrated into long-term strategic planning at the Library of Congress, and the Library is engaged in key discussions concerning preservation and conservation education. This program was a logical next step in mapping the landscape of collections preservation for the coming decade.

II. Preparatory Survey

In preparation for the program, the Library conducted a pilot survey of invitees using the commercial survey manager "SurveyMonkey." The survey had two goals. The first, and primary, goal was to stimulate participants' thinking about the topics to be discussed at the symposium. The second goal was to improve the organizers' understanding of participants' background education and training, and of the scope of responsibilities, skills, and knowledge they currently exercise in meeting the needs of their institutions. Both goals were met. The survey provisionally identified a number of trends to further inform symposium discussions, and participants indicated they found the survey both thought-provoking, and good preparation for the meeting.

Several caveats constrain extrapolation of findings to a larger universe. At the same time, they are instructive for understanding the complex and changing roles of professionals in these fields, and they would inform development of a larger, statistically representative survey. The survey assumed that each respondent could easily choose one clear category (i.e., conservator or preservation professional) as a professional role. Respondents were then automatically tracked to subsequent survey items based on that choice. In fact, among senior professionals, a combination of conservation, preservation, education, and other categories of activity is common. Some respondents reported they drew on more than one role for their responses.

From the start it was recognized that the survey universe was too small (97) and too diverse to allow generalizations. In addition, there were too few responses (56, or 58% responded) to support statistical analysis or confidence. In addition, although it was not originally intended to sample outside the conservation or preservation field, as the program grew to include educators in regional conservation centers and related graduate education (film, library, and information science programs), these invitees were included in the survey population to meet the goal of meeting preparation.

Perhaps the most interesting finding was that while 93% of respondents indicated that the primary focus of their training was in conservation (that is, a focus on treatment), only 58% now call themselves conservators. For the balance, titles include conservation or preservation manager or administrator, educator, or consultant.

Respondents represented a range of experience from less than 5 years to more than 20 years in the field, with 87% reporting 10 or more years in the field. Sixty-seven percent of respondents have advanced academic degrees (most are master's degrees), or post-graduate certificates of specialization, but 47% reported that internship was their second most important source of training.

Respondents represented a very broad range of institutions and collection materials, spanning a variety of institutions. These included academic or research libraries (31%), art museums (15%), university faculty (15%), and private practice (13%), with smaller numbers in other library, museum, and archives settings. All respondents indicated responsibility for multiple collections. One hundred percent of respondents reported responsibility for photographic materials, and 81% reported responsibility for digitized collections (69% are responsible for "born digital" materials). This validates the concerns identified below for improved collaboration and training for work with digital preservation as important to

contemporary institutions.

Respondents who identified themselves as conservators were asked to rate their primary training for 37 tasks typical of such roles on a 5-point scale from "well prepared" to "poorly prepared." Respondents rated their primary training as poor preparation for 11 tasks they agreed were applicable to their jobs. Among those tasks were managing people or projects (39% = poorly prepared), budgeting (33%), and policy and facility planning (41%). In contrast, respondents who identified themselves as preservation professionals did not rate their primary training as poor preparation for any of 37 typical tasks. This, too, appears to confirm the need to prepare students in conservation training programs for a broad range of responsibilities or to provide required and compensated internships or post-graduate training to complement their academic curriculum.

As further validation of the complexity of contemporary preservation and conservation roles, 50% of preservation respondents indicated they did not believe their education and training were completely adequate to their responsibilities. Seventy-three percent advocated increased fellowships or internships, and 68% advocated expanded course choices. Among conservators, 53% reported that they did not find their education and training completely adequate, with 75% advocating increased fellow or internships, and 70% advocating increased course choices.

A full 91% of respondents said new or increased cross-disciplinary collaboration is needed to assure future preservation and access to library, museum, and archives collections. Fifty-nine percent of these participants indicated that increased collaboration with a wide range of specialists, including computer scientists, engineers, materials scientists, museum and library specialists, and business experts would be needed for that purpose.

These findings are consistent with discussions at the symposium. They are highlighted to show the perspectives that gave rise to observations and suggestions described below. The organizers believe that consideration should be given to a larger, representative study to complement the findings of the Heritage Health Index, and to help inform decisions for priorities for preservation and conservation education and training in the next decades.

III. Program Description

On May 15-16, 2008, seventy-one senior leaders in conservation and preservation education and practice convened at the Library to examine needs, solutions, and priorities for education and training to help support the preservation of documentary library, archives, and museum collections to meet users' needs through the 21st century.

The symposium was funded primarily by a generous grant from The Getty Foundation to the Library of Congress (see program information at http://www.loc.gov/preserv/symposia/preseduc.html). It was co-sponsored by the Library Services Preservation Directorate of the Library of Congress and members of the International Federation of Library Associations' Preservation and Conservation North American Network, including Yale University and Pepperdine University Libraries; the Kilgarlin Center for the Preservation of the Cultural Record, University of Texas at Austin School of Information; and Preservation Programs, National Archives and Records Administration. The Library thanks the Institute of Museum and Library Services (http://www.imls.gov) for their assignment of Karen Motylewski, who designed and conducted the preparatory survey and prepared this report.

The symposium was intended to identify key issues related to preservation and conservation education and training. It met this goal admirably. The rich discussions provided a great deal of information to inform planning for the future of preservation and conservation education and training. The concerns and recommendations described here represent multiple perspectives, and include alternative approaches to meeting education and training needs for conservation and preservation.

Participants included leading practitioners, educators, and employers responsible for the preservation of

document collections in libraries, archives and museums in the US and abroad. They included specialists in book, paper, photo, special media or preventive conservation, conservation administration, and conservation science. Alumni and faculty of graduate education programs in these fields were well represented.

Their charge was to work together to synthesize and distill their cumulative experience and vision to identify preservation education priorities for the 21st century. The program combined thematic-focus small-groups with plenary sessions to address themes crucial to the future of preservation. The following themes were identified in advance to shape participant preparation. One theme was assigned to each group as the focus of its discussion, which was gently facilitated by senior staff of the Preservation Directorate.

- Who should be trained as preservation and conservation professionals, and how can we better recruit from new audiences, especially in underserved communities?

- What should we teach new conservators and preservation professionals to equip them to meet the needs of today's collections, particularly at-risk, modern, and indigenous collections?

- How can we use the latest innovations in education and technology to improve preservation training?

- How can we better assure the availability of resources to cover tomorrow's preservation needs?

Assigned recorders documented all formal discussions, and notes were subsequently circulated to the full group for validation or amendment. Plenary discussions confirmed and clarified concerns and concepts articulated in the groups.

IV. Scope of the Report

This report sets out to provide an accurate reflection of discussion among key representatives in the field. We believe this is a necessary preliminary to building consensus about future education and training to preserve cultural and informational collections. It is important to note that not all questions presented in small groups were addressed by meeting discussions, and that the group did not suggest solutions for all issues or concerns they raised. There is no exact correspondence between the observations and solutions reported, although most connections seem clear. In addition, observations and potential solutions do not necessarily represent consensus among participants or the view of the Library of Congress or its individual staff members.

Although the Heritage Health Index documented the scope and characteristics of collection condition across the US, and the need for preservation,[2] little systematic or objective data is available to document the details of staffing, staff preparation, or the demographics of preservation or conservation personnel. This meeting was not intended to address that gap, but discussions exposed the need for such information.

Participants were selected for their broad experience and knowledge of the field. Common concerns led each thematic-focus group to include many of the same topics in discussions, and to raise and deliberate issues outside the framework of the questions formally presented. The issues that emerged as most

[2] *A Public Trust at Risk: The Heritage Health Index Report on the State of America's Collections* (2005), Washington, DC: Heritage Preservation (http://www.heritagepreservation.org/HHI/full.html) is based on responses from approximately 3,480 libraries, museums, and libraries of all sizes and categories, with a ±1.5% overall margin of error. Among other findings, the survey documented very significant unmet needs for staff, training, essential activities, and resources for preservation and conservation of collections.

important for professional education, training, and public education for preservation and conservation in the coming decades are summarized under the topic headings below:

A. Preservation challenges in the digital age

B. Expanded preservation and conservation responsibilities

C. Funding, policy, and support for preservation

D. Erosion of conservation treatment skills

E. Internships and post-graduate training

F. Faculty and mechanisms for preservation and conservation education

G. High priority topics for preservation education

H. Outreach

I. Diversity in the conservation and preservation professions

Because the Symposium's goal was to gather information, rather than to instruct, in a few cases suggested solutions may reflect a lack of knowledge of existing resources. Footnotes identifying such resources have been added by the conveners.

Observations, suggestion, and discussion strongly imply an assumption on the part of participants that a national institution (such as the Library of Congress) will or should take key responsibility for pursuing solutions to problems identified. Such a course is not in the current mission of the Library or its Preservation Directorate, and the United States does not have a centralized cultural ministry or other government department under whose mission such a responsibility falls. This assumption was not pursued with participants, although it might be part of a systematic survey of the field at large. On the other hand, the well-documented need for preservation action and personnel well prepared for that purpose could be seen as strongly dependent on a systematic, concerted national effort that builds networks and resources for the purpose. In most cases, such an effort depends on concentrated leadership.

V. Issues and Potential Solutions

A. Preservation Challenges in the Digital Age

The growth of machine-readable and machine-dependent media including sound recordings, moving images, and digital media demands substantial new skills and knowledge. Challenges include the distinctly different patterns of individual talent and interest that produce conservators, preservation managers, and IT personnel; a tendency of the technology sector to confuse the nature of physical records with mechanisms for their virtual access; and demand for and volume of digital records.

Both digitally reformatted and digitally created resources are omnipresent and critical challenges for preservation. They are susceptible to physical and chemical deterioration, loss through technology evolution, and loss through the inadequacy of standards, specifications, and quality control in their production and migration. There is a need for professionally managed digital repositories that meet the standards developed. A number of models are operational, but such repositories have a high cost. Preservation research, additional models, and pilot programs are a very high priority in the digital library and archiving communities because no reliable, systematic, and sustainable solutions to assuring long-term access to digital records have yet emerged.

The significant vulnerability of moving image and recorded sound collections has also recently come to prominence. These materials are susceptible to physical and chemical deterioration and to loss through the obsolescence of playback equipment. These formats are intimately linked to the challenges of digital preservation because digital reformatting has become the foundation for their preservation and access.

Key concerns identified by symposium participants included the following:

1. Relatively few professionals have significant expertise in the preservation of audiovisual and digital formats, and little preservation education focuses on them.[3] Many disciplines are working in this area, but independently or in relative isolation. These include not only preservation experts, computer scientists, and librarians, but also materials scientists, engineers, audio and video technicians, and others.

2. Reformatting initiatives require staff with training in management as well as the physical characteristics, requirements, and practices that pertain to these media. These are not typically emphasized in the education and training of conservators and may be insufficiently represented in the curriculum for preservation professionals.

3. To a greater extent than any other cultural collections medium, the preservation of digital materials draws on professionals from outside the traditional fields of preservation and conservation. There are significant differences in core concepts (e.g. the meaning of "long term"), vocabulary, funding, and skills between most preservation and conservation professionals and those closely involved in the development of digital technology. Education in both directions about key concepts, goals, and practices is critically important to assure continued access to digital materials and to protect the economic investments in their development.

4. Differences and rapid changes in terminology at the most basic level impact the collaboration of preservation and "digital library" professionals. Preservation in the digital context is variously called digital archiving, preservation, digital assets management, and digital curation, reflecting adoptions from other contexts to the challenge of long-term access to digital resources. Such changes may be inherent in the relative youth and rapid evolution of digital technology, but it is important to develop an effective way to exchange information across these domains.

5. Decisions pertinent to collections development and management, independent of collection type, significantly impact but frequently exclude preservation and conservation staff. An obvious example is the need for stabilization or other treatment of items chosen for digitization, but others include the acquisition of historical collections, especially audiovisual materials, and exhibit planning. It is vital to correlate preservation expertise in strategic planning and budgeting for the acquisition, creation, management, and use of digital collections.

6. Professional disciplines and organizations do not collaborate very effectively around issues of preservation, conservation, and collections development, especially in the digital context.

7. The demand for digital access has created tensions around the value of original objects and the need to preserve pre-digital formats, the drive to transform and create resources in digital form, and the need to protect the investment in digital collections by preserving the collections created. Many in the preservation and conservation communities express concern that decisions to direct

---

[3] New York University has developed a flagship program in its Moving Image Archiving and Preservation Program (MIAP), which emphasizes digital expertise. The University of Texas and the University of Kentucky are developing strong educational programs for digital asset management, audiovisual preservation, or both, but funding for these programs and those students who are attracted to them needs to be increased and stabilized. Indiana and Harvard universities have collaborated on a Web site for audio preservation, *Sound Directions, Digital Preservation and Access for Global Audio Heritage*: http://www.dlib.indiana.edu/projects/sounddirections/.

substantial resources to digital projects deplete preservation resources already strained by the expense of preparing materials for digitization.

8. Preservation professionals need to better document and communicate the real costs of digital projects, assisting decision makers to factor realistic lifecycle requirements for long-term digital curation into project planning and budgeting.

Potential solutions. Solutions to help address the need for professionals educated and skilled in preserving the digital record included the concepts summarized below:

1. Foster collaboration across disciplines and professional organizations that focus on preservation of the original object where appropriate and the creation and preservation of the digital record. Encourage intra- and interdisciplinary liaisons and find ways to increase participation of preservation and conservation professionals in digital development and decision making. Fund preservation and conservation professionals to participate in digital library and digital archiving professional meetings. [4]

2. Establish a dialog among preservation and conservation, IT, materials scientists, and senior management professionals in libraries, archives, and museums to explore the complementarity and other relationships among original, digitized, and born-digital documents and other objects. Articulate principles and best practices to inform decisions for preservation of original digital objects such as CDs, DVDs, and others.

3. Develop curricula and continuing education opportunities that support the exchange of conservation, preservation, and technology knowledge, for instance by developing effective training strategies for interdisciplinary teamwork. Continue to develop and promote team-teaching approaches and improve student preparation for career-long collaboration.[5]

4. Develop a thesaurus to enable preservation and conservation and IT professionals to better communicate with one another, and to articulate terminology to distinguish physical vs. file formats and other distinctions where confusion currently arises.

5. Develop hybrid academic degree programs to better equip preservation and conservation professionals to act and collaborate effectively in the IT realm (see entry B.5, above).

6. Develop a "crash course" in digital library developments and core concepts for preservation professionals.[6]

7. Develop and publicize a centralized source of information about significant digital initiatives for the preservation community. This will help individuals and institutions identify key sources for applications for funding and complementary initiatives, including IMLS, the National Science

---

[4] Differences and rapid changes in terminology at the most basic level impact the collaboration of preservation and "digital library" professionals. Preservation in the digital context is variously called digital archiving, preservation, digital assets management, and digital curation, reflecting adoptions from other contexts to the challenge of long-term access to digital resources. Such changes may be inherent in the relative youth and rapid evolution of digital technology, but it is important to develop an effective way to exchange information across these domains.

[5] IMLS grantees have identified the need for collaboration training and tools for as a significant need, but such resources are not widely available for the museum or library context. It may be productive to seek models in the for-profit world for adaptation to the context of cultural collections and education.

[6] The School for Scanning and Digital Directions training developed by Northeast Document Conservation Center may offer models to meet this need.

Foundation (NSF), the Mellon Foundation, and the National Endowment for the Humanities (NEH), all of which have invested substantially in the development of digital libraries.

8. Provide a clear and easy-to-use portal or guide to information and education about preservation in the digital environment.

9. Develop research-based tools to quantify and project real costs of digitization projects and long-term digital curation, including all phases from selection and preparation through reselection and preservation. Design these tools to permit alternate assumptions and to accommodate recalculation as digital technologies and preservation strategies evolve.

B. Increased Responsibilities for Conservation and Preservation

Conservation staff must often fill a broad range of high-order responsibilities ranging from complex treatment of collection objects, to needs assessments and damage prevention, through management, fund-raising, and public education. While graduate conservation and library preservation education programs attempt to prepare their graduates for this challenge, a limited body of knowledge and skills can be transmitted in the time available (in preservation, typically two years of graduate school, three years if a certificate of advanced study is sought in library or information science (LIS) programs).

This expansion of responsibilities, exacerbated by the rapidly growing preservation needs of digital and other machine-readable collections, gives rise to related issues in two areas: the need for expanded knowledge and skills in preservation and conservation staff, and the need for improved collaboration and communication among staff in all decision-making roles that impact collections.

The following concerns were identified in discussions, representing both necessary knowledge and skills, and the breadth of responsibilities institutions assign to preservation and conservation staff:

1. Although the American Institute for Conservation (AIC), the American Library Association (ALA), and other professional organizations have developed competency schemas, there is no consensus about what constitutes core competencies. There is no coordinated catalog of essential skills and knowledges at specific levels of professional development in either preservation or conservation in general, or for specific formats or contexts.[7] Graduate conservation training programs center on skills and knowledge reflected in the AIC core competencies, but those who come into the field through other routes may not have the same training or orientation. Participants noted that courses and workshops for "core competencies" have traditionally been hard to fill.

2. Conservation treatment ranges from extensive, detailed chemical, mechanical, and cosmetic intervention to basic repair or stabilization. Treatment may be applied to a single object or a whole class of items. A comprehensive preservation program includes choices from the whole treatment spectrum, and adds planning, administration and management, preventive strategies,

[7] The AIC has published core competencies that apply to conservators, conservation technicians, and collections care staff, but these are not universally recognized by those who work with collections. The ALA Association of Library Collections and Technical Services (ALCTS) is developing core competencies for library preservation staff. The Society of American Archivists (SAA) includes preservation and protection of collections in its certification examination (which implies core competencies), and in New Skills for a Digital Era (2007) (http://www.archivists.org/publications/proceedings/NewSkillsForADigitalEra.pdf), which identifies the core competencies required for archives preservation. Each effort is excellent, but they have distinct differences as well as similarities. AIC has deliberated practitioner certification for more than twenty years. While certification could eventually define a set of knowledge and skills to be expected of every conservator, it would not address complementary criteria for preservation managers, and it has been understandably delayed by the complex issues involved, not least the small size and broad range of the field and the economics of certification.

as well as the production of surrogates of various kinds. Such a program may include the responsibility for contracting and fundraising for preservation activities. The breadth of demands on preservation and conservation staff can dilute efforts, especially in not-uncommon settings where one individual must manage all streams of preservation activity.

3. Many institutions appear to have unrealistic expectations for the scope and volume of work to be carried out by preservation and conservation staff, independent of their experience or training. As in any profession, practitioners' skills and judgment grow with experience, but newly graduated professionals are often asked to shoulder responsibilities at every level. Resources for on-the-job learning need strengthening, and many new graduates need more real-world experience than an academic program can provide.

4. Differences in collections, their uses, and the culture of libraries, archives, and museums have led to basic differences in education and training to preserve their holdings. The traditional walls between libraries, archives, and museums are fast becoming more permeable, in part due to the development of digital technologies. Preservation staff are responsible for increasingly diverse collections, and in nearly every context these professionals now need digital preservation expertise. Machine-readable media (such as film and recorded sound) and machine dependent media (such electronic and digital formats) are particularly vulnerable to gaps in knowledge and expertise.

5. Research findings, standards and specifications, and changes in good practice accumulate over time, but the field has no requirements for continuing education, and no systematic strategies have been developed to help practitioners keep abreast of research findings or new developments. Ease and speed of access to information correlates strongly with the extent to which practitioners keep pace with changes in the field. Certification programs (e.g. the Society for American Archivists or the proposed program of the American Institute for Conservation) may encourage continuing education, specific goals have not been set.

6. Many preservation policies, good practices, and procedures exist only as local knowledge or gray literature. Strengthened mechanisms for identifying and sharing proven preservation practices and protocols are needed.

7. The digital context requires expertise in a wide range of technical subjects, including physical formats and storage, metadata, specifications and management for digital production and quality control, preservation strategies to address short technology life cycles, and more. Such responsibility does not replace, but is added to responsibility for pre-digital formats.

Potential solutions. Recommendations for addressing concerns for the breadth and volume of responsibility expected of preservation and conservation staff included the concepts summarized below:

1. Continue existing graduate programs for conservation and preservation, grounding their graduates in deep general knowledge base from which they can evolve in their practice as the field evolves. Recognize and adequately fund internships as a vital component of conservation and preservation education. Make such internships or post-graduate fellowships equivalent to post-doctoral fellowships.

2. Recognize and promote the validity and value of professional development tracks other than, and for purposes different to, graduate conservator education.[8] Develop a program specifically to train preservation/conservation technicians.

[8] The graduate preservation concentration and Certificate of Advanced Study at the University of Texas School of Information Kilgarlin Center for Preservation of the Cultural Record; the Preservation Management Institute at Rutgers University's School of Communication, Information, and Library Studies; and the collections care certificate Program of the Campbell Center are three

3. Develop strategies to increase the understanding of decision-makers and the general public that preservation administration is a different profession from conservation, and that both provide non-duplicative and essential skills and knowledge to collections-holding institutions. This might reduce the expectation that all professionals have all skill sets.

4. Recognize and promote awareness of specialized knowledge and skills needed to preserve moving pictures, recorded sound, and other machine-readable or machine-dependent formats, including digital collections, for which see below. Develop readily accessible information about available education and training for preservation of these formats, including short-format, online, and degree-granting programs. If no fully satisfactory programs exist, the development of one should be considered.

5. Investigate interest in and feasibility of developing and hybrid or double Master's degrees. Encourage and strengthen collaboration between closely allied disciplines such as museum studies, schools of library and information studies, and archival programs. There is a model for this blending in the "cultural heritage information professionals" (CHIP) discipline developing in Europe, and in the program for Cultural Heritage Information Management Education (CHIME) being developed at Catholic University of America's School of Library and Information Science.

6. Encourage and develop mechanisms to increase collaboration between preservation and conservation staff and decision-making staff in other key areas that impact library and museum collections. Examples include IT, collections development, and strategic planning.

7. Encourage and develop mechanisms to increase collaboration and contribution among allied disciplines and professional organizations to share information, refine curricula, and develop consensus about core competencies and entry-level skills. This is especially important in the development of new or hybrid specialties, and for media outside the traditional parameters of conservation (e.g. audio-visual collections).

8. Convene a meeting that includes the Executive Director of the AIC, members of the inter-organization Committee on Archives, Libraries, and Museums (CALM), members of the Association of Graduate Programs in Conservation (AGPIC), and key continuing education programs for preservation and conservation such as the Campbell Center, Regional Alliance for Preservation (RAP), and IAP as a logical next step for developing a strategy to achieve goals of continuity, consensus, and collaboration for preservation and conservation competencies and curricula.

9. Create and publicize a foundation document that articulates consensus about core competencies and expected competencies beyond the entry level. Such a document might be informed by competencies and pay scales developed by such agencies as the Library of Congress, National Archives, and National Park Service for federal employment, and these models should be widely shared.

10. Develop post-graduate and mid-career learning (including Web-based or -assisted) opportunities, for administration, development, communications, and other strategic management skills. Another strategy might be the development of pro-seminars parallel to those offered in other disciplines.

11. Create additional online resources, and make them available through a well-publicized and unified portal. For example, solicit and publish case studies as one way of communicating real-

---

models that could be explored. Both the museum and library fields have given rise to relevant programs in the past (e.g. the University of Delaware collections care training), but little information is immediately available. Research into their histories, market profiles, and economics is needed.

life problems and solutions, and of filling gaps in the literature and post-graduate learning resources. Digitize the AIC Conservation Catalogs, and make them available online, perhaps as "wikis" or curriculum resources to which "master videos" could be linked.

12. Broadly disseminate National Standards and Best Practices for U.S. Museums (http://www.aam-us.org/pubs/webexclusive/standards.cfm) recently published by the American Association of Museums (AAM). Encourage AIC to provide comment pertinent to preservation and conservation topics in the standards for potential revisions to the publication.

13. Systematically and formally identify gaps in preservation and conservation training and develop strategies to fill them.

C. Funding, Policy, and Support for Preservation and Conservation

Funding for preservation and conservation education and training is an ongoing challenge. Professionals in these fields are essential to control the loss of cultural heritage collections and access, but "market forces" are unlikely to sustain academic programs for these small, highly specialized, and relatively poorly-compensated professions. Their continuation is more effectively considered a public good.

Unlike many countries, the US has no national ministry of culture, and there is no organized state-level cultural heritage policy movement. A coordinated national advocacy effort and state-level organization are needed for preservation.[9]

Complicating the preservation landscape, the demand for digital access has created tensions around the value of original objects and the need to preserve pre-digital formats, the drive to transform and create resources in digital form, and the need to protect the investment in digital collections by preserving the collections created. The relative value placed on original objects and the information they contain is discipline-, focus-, institution-, and to some extent age-based. Perhaps the most pressing issue is that many models for digital preservation are being explored, but none has yet shown a comprehensive long-term solution.

Key observations of the group follow:

1. Preservation requires policy- and decision-makers to make funding and other resources for its support priority. Challenges include the many competing priorities in libraries, archives and museums; the constraints of economics in cultural heritage institutions; and prevailing models that privilege cost recovery, if not profit, from services and products.

2. Preservation and conservation professionals are often left out of the decision-making process for crucial choices that impact collections preservation, from acquisition and exhibition to building design to preparation for access. The absence of preservation and conservation input for these decisions often has significant, avoidable, negative implications for collections and costs.

3. Preservation and conservation professionals need to sell their importance more effectively. Among key areas of need are: vivid ways to communicate preservation values, procedures, and risks, to increase the "preservation consciousness" of those outside the preservation community (both institutional decision makers and the public at large); strengthened public relations,

[9] Heritage Preservation has provided substantial leadership in this arena as an NGO. Federal agencies such as IMLS and NEH are debarred from advocacy, but work steadily with professional associations such as ALA and the American Association of Museums (among others) to formally and informally gather and provide information to Congress and other decision makers about preservation and conservation concerns. Under the direction of Anne-Imelda Radice IMLS has made preservation awareness and support a key focus. The IMLS, NEH, and special programs such as Save America's Treasures (administered by the National Park Service) have provided significant support for preservation and conservation, but their budgets are only sufficient to make modest inroads against the scale of need.

outreach, negotiation, and writing skills for preservation and conservation staff; and data to support arguments for preventive versus corrective intervention such as investments in environment, monitoring, staff training, and similar strategies to forestall or significantly slow collections damage or loss. Participants observed that when effective education takes place, decision-makers are more likely to support and advocate for preservation.

4. Many preservation programs run on limited resources, competing with other important institutional priorities. The priority for preservation has tended to correlate with its priority for external funders, especially major sources of federal and foundation funding. This has created an uncertain funding stream for preservation and conservation in many institutions.

Potential solutions. Suggestions are summarized here:

1. Provide basic preservation education for all personnel in cultural heritage institutions, including those who don't think of themselves as directly responsible for preservation. This can help senior decision makers better understand the context for key decisions that impact the importance, and consequently resources, of their institution's preservation and conservation effort.

2. Conduct statistical research to provide data-based decision-making tools and identify effective strategies to educate decision- and policy-makers about the information value of original artifacts. Research is needed to quantify risk; develop data-driven models of return on investment, cost-benefit, and real costs of intervention; and identify compelling arguments for preservation to those outside the field of cultural preservation.

3. Continue to fund the incorporation of preservation and conservation as core components of introductory graduate library, archives, and museum courses, and as required courses in the curriculum of all professionals in these fields.

4. Find ways to fund preservation and conservation professionals to participate in standards-creating bodies, which influence development and application of technology products.

5. Promote connecting preservation to acquisition to help address the challenge of funding, for example in the form of preservation endowment to accompany gifts. This would help assure appropriate preparation and care of all collections.

6. Research and disseminate information about available resources for education or training in communications, grant-writing, and development for preservation and conservation staff. If such training is not available, develop a resource (workshop, manual, guidelines) for the target audience of preservation and conservation professionals.[10]

D. Erosion of Conservation Treatment Skills

The extensive knowledge and hands-on treatment skills of conservators represent a critical preservation resource. These applied skills impact the condition and usability of damaged and at-risk objects across a wide spectrum of machine-independent media (examples include books, paper, photographs, and other "traditional" objects). While most libraries, archives, and museums do not yet think of the media of machine-readable or -dependent formats as a target of physical treatment, the carriers of images, especially moving images, and sound recordings in special collections also deteriorate. Their condition and the possibility of treatment will impact the capacity to emulate, refresh, migrate, or otherwise preserve their content (and the significant economic investment in their creation) in the long term.

[10] The Library has developed and makes available on its Web site *Foundation Grants for Preservation in Libraries, Archives, and Museums* (http://www.loc.gov/preserv/foundtn-grants.pdf) for this purpose. The source of this information, the Foundation Center and Foundation Directory are nationally respected resources for funding research and training.

Symposium participants expressed concern that treatment skills were eroding, especially the capacity to carry out highly complex or challenging treatments. This erosion results from multiple factors:

1. The conservation field is small. The Web site of the American Institute of Conservation reports that it has "3,300 conservators, educators, scientists, students, archivists, art historians, and other conservation enthusiasts in over twenty countries." The only other reasonably good source of statistics for the number of conservators is Conservation OnLine, which lists approximately 10,460 subscribers worldwide, including 4,017 in the US and 576 in Canada, with an interest in conservation and preservation.[11]

2. Formal graduate programs have been the primary source of trained conservators in North America since approximately 1960, when the first graduate conservation program was founded at the New York University Institute of Fine Arts. Five such programs in North America currently train conservators for the treatment of art and cultural artifacts, including photographs, paper, books, and other formats comprising the bulk of library and archives collections. Each program graduates approximately 6 to 8 conservators per year including all specialties. One program trains conservators specifically for library and archival contexts.

3. The sheer volume of information and experience required to become a skilled conservator in any discipline is daunting. The graduate training programs are increasingly expected to produce graduates with a very wide spectrum of skills and knowledge beyond those applicable to conservation treatment. These range from chemistry, art history, and materials science; through environmental and building management; to emergency planning and response; and to program administration and management. The curriculum and time required to meet these expectations necessarily reduces students' exposure to and practice in treatment.

4. Mastery of treatment design and implementation requires many years of experience. Many institutions' expanded focus on preventive care, a necessary and highly desirable development that began in roughly the late 1970s, has also had less desirable consequences. Staff time for treatment is decreased as other responsibilities accumulate, reducing treatment practice and experience. Institutions may contract complex or large-scale treatments to regional conservation centers or private practitioners, reducing the number of conservators with extensive treatment experience by concentrating treatment in a smaller pool of conservators. Since library, archives, and museum resources are finite, and often modest, funding for conservation treatment is reduced, in turn reducing the total number of objects treated, and the number of objects receiving extensive treatment (as opposed to stabilization). Opportunities to gain treatment experience are reduced overall.

5. The economics of conservation education and employment may also erode treatment skills. Salaries in this field are below those of other disciplines with analogous requirements for graduate education and skills. The most obvious economic impact is the challenge of attracting a fully diverse pool of students to the field, but earning potential also affects the development of conservation treatment skills. Graduate conservation programs typically take about three to three and a half years of full-time study, including required internships and fellowships. For practical purposes additional time cannot be added to this course of study to strengthen treatment skills.

6. The first cohort of academically trained conservators was at the leading edge of the baby boom generation expected to retire in increasing numbers over the next ten to fifteen years. The

[11] Categories used by the US Bureau of Labor Statistics (BLS) Occupational Outlook Handbook (OOH) differ significantly from those used inside the conservation and preservation fields. The OOH groups museum technicians and conservators with curators and archivists, and estimates 11,000 museum technicians and conservators employed in 2006. There is no functionally parallel category for conservators or preservation professionals in library settings. These are an undifferentiated subset of librarians in the OOH. The BLS OOH definitions and groupings don't appear useful for this discussion.

accumulated treatment experience of these professionals is vulnerable to loss, since there is no systematic program or vehicle to transfer their skills to younger conservators. In particular, institutionalized internships or fellowships are rarely if ever offered for study with conservators in private practice, who typically have the most extensive skills and experience.

7. The group noted possible gaps in education for the treatment of rare bound materials. It is apparently difficult to find conservators in private practice with the desired skills. Rare book conservators do not (as a group) appear to have the same level of science education as those in other disciplines. No reasons were offered, but rare book conservators are often trained in Europe, through long apprenticeship, or through craft-oriented programs, which have in the past de-emphasized science education.

8. There appears to be decreased emphasis on connoisseurship, the history of cultural records, and the nature and history of media and materials used to create cultural records. This can impact the quality of conservation treatment.

Potential solutions. Recommendations to address the concern for erosion of conservation treatment skills included the following. Many of these previous suggestions could also help address concerns about mastery of knowledge related to the history of technology for cultural records and connoisseurship:

1. Create additional and better-supported post-graduate fellowships to enable recent graduates of conservation training programs to build their treatment experience under the guidance of more experienced conservators, in collections-holding institutions that carry out complex and large-scale treatments. This solution would have the benefit of strengthening those institutions' production capacity while disseminating skills to the field and facilitating the transfer of experience from senior practitioners. The solution depends on new or expanded funding from federal agencies or foundations to the training programs, or the host organizations, or both.

2. Create opportunities for mid-career fellowships to facilitate skills expansion for conservators whose practice or institution has identified the need for new or broadened treatment skills.

3. Create mid-career teaching fellowships or senior scholar initiatives. Mellon Fellowships offer one model to preserve expert knowledge by facilitating skills transfer from senior practitioners, or from conservators with highly specialized skills, to others.

4. Explore and develop strategies to use new media, especially technology-assisted education and Web-based learning resources, to facilitate training in common conservation treatments, or provide "refreshers" for practitioners who have not used specific skills in their recent past. One example is the adaptation of haptic technology, currently in use for medical and dental training, to conservation. Small-scale efforts to develop haptic conservation resources have been undertaken by the University of Washington in partnership with the Library of Congress, and in the United Kingdom.

5. Explore the feasibility of developing Web-based or -assisted professional training in treatment skills with the American Institute for Conservation, the Campbell Center for Historic Preservation Studies, and the UK-based International Academic Projects Ltd. (IAP) all of which offer conservation refreshers and/or skills training. Another possible developer might be one or more of the graduate training programs in collaboration with other stakeholders such as library, archives, or museum directors or other senior users of conservation treatment services.

6. Develop enhanced training for conservation of rare bound materials within an existing graduate program to help address this gap.

7. Use videotapes to capture the skills of master conservators before they leave the profession. Make these available through a portal in combination with other resources, or support availability

through a subscription model if market research suggests willingness to pay for access.

8. Strategies to address possible gaps in science education, particularly in the preparation of rare books conservators, were not offered by participants. Both the Campbell Center for Historic Preservation Studies in Mt. Carroll, Illinois, and the University of Austin, Texas, Information School offer summer on-site courses in chemistry for conservators. An online course in this subject is offered by IAP.

E. Internships and Post-Graduate Training

Internships and other forms of post-graduate training are considered vital for the development and maturation of skills and judgment. At the same time, these learning experiences vary significantly among hosting institutions and specialities. Key concerns identified by participants follow:

1. Federal funding is a primary source of support for collections preservation, but in the past it has targeted collections rather than staffing. This focus may privilege outsourcing over development of in-house capabilities. This can disadvantage the development of long-term preservation capacity within an institution in favor of treatment (mass or individual-item) of existing damage, at the expense of preventive environment and care. Internships are created under this model may meet the short-term priority needs of individual institutions, rather than the long-term learning needed for preservation and conservation in general. In fact, the availability and quality of internships is spotty.

2. Funding for intensive post-academic experience has been limited, depending on the creativity of individuals and academic program staff to find and support such opportunities, and the willingness of host institutions to provide them. Host institutions may see interns and fellows as solutions to their own preservation and conservation economic constraints, rather than as educational commitments.

3. Internships and other post-graduate learning experiences are not standardized. As a result, it is difficult to know what skills and knowledge they have built. This is disadvantageous to both learners and subsequent employers, whose expectations may be inaccurate or unmet.

4. Advanced or mid-career learning experiences are difficult to find and hard to fund. Few institutions or individuals can afford the economics of staff or income coverage for extended learning of this kind.

Potential Solutions. The following suggestions were made to help address the need for post-graduation learning (primarily for conservators):

1. Better publicize resources for funding internships and analogous learning experiences (distinct from funding collections care).[12] Better educate the field in funding and development skills, including the creation of endowed internships or fellowships, possibly in collaboration with an organization like the Foundation Center.

[12] The federal Institute of Museum and Library Services makes competitive grants that could support programs in the categories Museum Professionals for the 21st Century, Laura Bush 21st-C. Librarians, and grants for African American History and Culture and for Native American libraries and museums. All of these categories would entertain proposals from institutions to meet the need for internships or similar initiatives. The Foundation Center and its databases and training, and the recently published Library of Congress *Foundation Grants for Preservation in Libraries, Archives, and Museums* provide information about foundations that have funded or would accept applications for this purpose.

2. Raise the quality and level of post-graduate internships, following the model of post-doctoral programs in technical fields and emphasizing research. Assure that such positions provide a living wage. New York University's film program found that 80% of students would prefer such a solution to an additional year of school.

3. Develop endowments to sustain internships and analogous learning experiences, for graduate education programs, institutions that wish to offer them, or both. One model is the Challenge Grants of the National Endowment for the Humanities.[13]

4. Develop specifications and guidelines to increase consistency of internships and fellowships for new professionals and provide the resources to properly monitor them to ensure a quality experience. One model is offered by the Society of American Archivists Archival Internships: A Guide for Faculty, Supervisors, and Students.

5. Develop a mentoring program to expand skills of new graduates, modeled after the international Fulbright Specialists Program.

6. Examine the feasibility of developing a cultural AmeriCorps to strengthen skills complementary to physical protection and treatment of objects, with a similar provision to help students pay off student loans and explore interest in funding an AmeriCorps-model program with such institutions as Heritage Preservation, the American Association of State and Local history, or the Institute of Museum and Library Services.

F. Faculty and Mechanisms for Preservation and Conservation Education

The need to educate for preservation extends from professional-level knowledge and skills; through training to identify risks, needs, priorities, and to implement context-appropriate solutions; through outreach to increase awareness of policy-makers and the general public. Fortunately education and training can draw on an expanding array of strategies to reach the variety of audiences and settings involved.

Symposium participants raised the following issues related to the necessary mechanisms for basic and continuing education and training:

1. The bulk of courses in graduate preservation/conservation programs are taught by non-tenured and adjunct faculty, in part because the terminal degree in these fields is the Master's. Advantages include variety and currency of experience, exposure to a spectrum of teaching styles, and coverage of emerging topics and trends, but over time students may be exposed to inconsistent content. Preservation and conservation academic education need a blend of adjunct and tenured faculty to assure continuity.

2. Videos and other online learning resources are extremely important, but they cannot meet the need to develop hand skills, hand-eye coordination, or judgment for treatment tasks. It is questionable whether they can fully prepare learners to construct enclosures, carry out good simple repairs, or implement salvage procedures.

3. Too few permanent tenure track positions exist to support a robust culture of conservation and preservation research. Such research is needed to develop new solutions, topics, and curricula.

[13] The Mellon foundation has provided significant funding for internships, anticipating that host institutions would provide matching and continued funding, but few grantees succeeded in creating self-supporting programs. It could be informative to survey grantees in that program to identify factors for success and failure to endow internships.

4. Fundamental research to strengthen preservation and conservation decisions and increase effectiveness and efficiency are needed, but there is a very small pool of conservation scientists with sophisticated research skills, especially in the disciplines of materials science. This field is little known outside of preservation and conservation, reducing opportunities for funding. Educational programs need to be better publicized, and career paths need to be better understood.

5. A major demand on faculty time for training conservators is the creation of working models and surrogates for treatment practice. This reduces the time available for curriculum revision and supervision of practice. Similarly, learners outside the academic classroom need access to sample sets that provide three-dimensional, hands-on experience for assessment and basic repairs.

6. As in other technical fields, textbooks are expensive and need regular updating. Fundamental preservation and conservation education resources (like the Paper Conservation Catalogs) are not yet widely available online. Access to the literature, or, more accurately, convenient and fast enough access to encourage routine use) can depend on a library that provides offsite users with Web full-text, print-on-demand, or document delivery for this technical, small-audience, journal literature. Those professionals working in academic library settings may have such access, but many public libraries don't have sufficient demand to make this feasible, and costs are prohibitive for most individuals.

Potential solutions. Recommendations for strengthening available learning opportunities included the following:

1. Create a centralized resource inventory and directory,[14] including bibliographic references on the subject of preservation and conservation education and training. Focus on faculty/trainer needs was suggested to help educators know what resources are available to support them.

2. Find a way to "embed" library services in online classes[15] to help guide and meet students' bibliographic needs.

3. Develop learning sets of tactile materials to circulate to users of distance learning experiences. One example is samples of high- and low-quality mends. The availability of physical sets would also be important in creating videos of master conservators to preserve their skills and knowledge.

4. Recognize that younger learners do not respond to the same pedagogies that taught most established faculty and professionals. Distance education for preservation and conservation should not only be available, but should use multi-media technologies, which might include video; Web; Skype or parallel communications tools; social networking functions; and other learning strategies.

5. Explore the use of "virtual worlds" (following the model of computer gaming and/or social networking mechanisms such as Second Life) would be effective for outreach, and would encourage student-to-student interaction as well as student-faculty interaction.

---

[14] Conservation Online (CoOL) and the Bibliographic Database of the Conservation Information Network (BCIN) provide extensive bibliographies and citations to this literature, but neither provides full-text access to the bulk of cited publications, which is, of course, constrained by copyright, or to comprehensive up-to-date directories of available education and training.

[15] A number of state library agencies now provide statewide "24/7" reference online and/or via phone to residents of their states for answers to specific questions. Increased dissemination of this availability might help meet some of the reference and bibliographic needs implied by symposium discussions.

6. Develop technology-assisted approaches to learning hand skills based on the haptic technology that has proven effective and efficient in other fields, such as dentistry and medicine. Continue to explore the feasibility of haptic training for conservation, especially for skills such as mechanical cleaning and removal of brittle, sticky, or obscuring adhesives, tapes, and backings, all of which are fundamental and require extensive practice and experience.

7. Develop synchronous and asynchronous online learning resources and models for preservation and conservation education.

8. Facilitate inter-institutional collaboration and sharing of online courses. See the multi-university WISE consortium for online library and information education for a model.

9. Find sources of funding to increase permanent faculty positions in preservation and conservation.[16]

10. Identify strategies to address the limitations of the terminal degree in preservation and conservation. Develop more ways grant-making organizations fund scholarships for PhD students.[17]

11. Research the development of conservation scientists and publicize existing programs for their training to strengthen recruitment.[18]

12. Develop additional sources of funding for preservation and conservation research.[19]

G. High-Priority Preservation Education Content

Participants identified topics for which widespread basic education and training are desirable. These focus on whole-collections preservation planning and risk management (including emergency preparedness). See section A for parallel concerns pertaining to education for preservation and conservation in the digital collections context. Observations included the following:

1. Individual cultural institutions seem prone to reinvent the wheel when it comes to defining their preservation needs, identifying priorities, choosing solutions, and measuring results of their actions. The literature has gaps in these areas, and best practices are not well disseminated.

2. Budgeting for risk assessment, emergency preparedness, and response to emergencies appears to be a nearly universal challenge to collections-holding institutions.

3. The field has not yet found highly effective ways to communicate the need for strategic preservation planning across institution types and sizes. This is particularly pressing for less-well-resourced institutions and those in under-developed countries.

---

[16] As with information about the demography of the profession, little or no objective information is available about the student demand for preservation and conservation degrees or the market for such graduates.

[17] Institutional applications for programs that support doctoral students are eligible for IMLS Laura Bush 21st-C. Librarians and 21st-C. Museum Professionals grant programs. The goal of such grants is faculty development; preservation and conservation are eligible arenas.

[18] Such programs have waxed and waned for poorly understood reasons, in part related to funding. A doctoral program in archaeological science at the University of Arizona was funded by the National Science Foundation from 2002-08, and Johns Hopkins University is seeking funds to initiate a materials science program for cultural preservation c. 2010.

[19] Such research is eligible for Conservation Project Support grants from IMLS as well as programs noted in note 15.

4. We have not yet achieved the necessary level of emergency preparedness in collections-holding institutions. Gaps include widespread awareness of education and training resources available, and in guidance for salvage and recovery for a few categories of collection, such as vellum.

5. Information, education, and training for digital library preservation still lags behind the need.

Potential Solutions. Suggestions included the following:

1. Improve tools for assessment and progress tracking in collections-holding institutions; explore solutions developed by industry for this purpose. Develop a "union catalog" of survey tools that can be tapped by institutions as well as preservation and conservation professionals.

2. Publish case studies in planning and emergency response for a variety of institutions and collection types. Develop information from "first preservers" who have responded in major disasters and make it widely available.

3. Develop an interactive emergency preparedness planning tool suitable for a variety of institutions. This would create a customized plan based on information provided by a user.[20]

4. Provide more "hands-on," simulated disaster workshops. These appear to be highly effective.

5. Make detailed information for response to emergencies for all types of collections materials readily available to conservators, for instance on a set of laminated cards.[21]

6. See also recommendations in section A, Preservation Challenges in the Digital Age.

H. Outreach

Discussion identified three key areas for outreach efforts. The first was the need to strengthen preservation knowledge and awareness among decision-makers and non-preservation staff in institutions that hold cultural heritage documentary collections. The second was the need to increase interest among a broadened spectrum of professionals whose expertise is not directly related to, but significantly complements preservation practice and action. The third was the importance of improving knowledge and awareness of the importance of preservation among the general public.

Successful preservation is intimately linked to many functions and decisions in any collections-holding institution, and heavily dependent on informed pro-activity. That is, it is not an isolated body of actions that can be added or subtracted without consequences as "hot" trends develop in library, archives, and museum management. Effective and cost-effective decision making require staff trained to carry out preservation activities, but they depend equally on managers and staff responsible for nearly every function throughout an organization.

The importance of networking and coalition-building arose in all discussion groups, albeit for different topics.

---

[20] Northeast Document Conservation Center has developed such a tool, *dPlan: The Online Disaster Planning Tool*. The field has also developed extensive information resources for both no-cost online use and for purchase. The *availability* of tools does not seem to be the limiting factor; increasing awareness of the importance of planning and increasing resources and knowledge of the tools for it remain challenging. Heritage Preservation offers a print fill-in *Field Guide to Emergency Response* and is currently carrying out a pilot program to explore the feasibility of an emergency planning effort analogous to the Conservation Assessment Program.

[21] Heritage Preservation offers durable, reasonably priced solutions in the form of the water resistant *Emergency Response and Salvage Wheel* and the *Field Guide to Emergency Response*, available through the Heritage Preservation Web site.

Participants' observations included the following:

1. Communication and cooperation between different players is lacking. Preservation professionals must work together with diverse groups to be effective, but often these groups do not share concepts or language. Examples include emergency responders (first and long-term), appointed and elected officials, and senior executives of institutions. This impacts efficiency and effectiveness on both sides.

2. Small institutions with limited staff and resources, especially in areas where there are few or no conservators, may function as important community information centers for preservation. These organizations need to be well prepared and to know what resources are available to help them fill this role and their complementary responsibility to strengthen preservation outreach and awareness.

3. Successful cultural heritage preservation is closely related to awareness of its importance in a society at large. Ongoing education is needed to strengthen knowledge and advocacy for the protection and care of family and community collections as well as the collections provided or held in trust by institutions.

4. Many excellent sources of information have been developed by a multitude of organizations such as the Library of Congress, Heritage Preservation, regional conservation centers, and university preservation programs. Unfortunately effective strategies for very broad information transfer about preservation and conservation have never emerged. In addition, relatively unsophisticated users may have trouble navigating the sheer volume of available information.

Potential solutions. The following ideas to address the need to strengthen the knowledge of a broad public audience were offered:

1. Identify or create a centralized coordinating institution or organization to reduce redundancy and provide easy-to-find information appropriate to users with a variety of backgrounds and specific needs and interests. A central portal would maximize the many excellent existing Web resources to direct users to "just enough, just in time" information, or information that meets a highly-focused need.

2. Explore creation of a centralized coordinating organization to help local and regional interests develop "safety nets" for emergency response and preservation problem solving.[22] State Library Administrative Agencies, state or regional museum associations, and/or state humanities councils might be logical collaborators for such a safety net.

3. Reach individual communities, in particular minority cultural communities, by soliciting input about their preservation concerns and needs. Explore results and potential for expansion of outreach models to cultural and ethnic communities that have been developed in Australia, the National Museum of the American Indian, and the National Museum of African American History and Culture.

4. Make key preservation information available in multiple languages.

5. Develop a cultural AmeriCorps to strengthen preservation in skills and knowledge in community-based institutions. Explore interest in funding such a program, including tuition forgiveness for conservation and preservation students who agree to work for some period in underserved geographical or cultural communities.

---

[22] See footnote 19.

6. Develop and widely disseminate resources for K-12 teachers to teach preservation and object awareness.

7. Develop informal preservation learning pathways in cooperation with community-based institutions such as libraries and museums.

8. Work with media sources to develop and promote additional public service announcements and programs such as the four-minute public service announcement and brochure recently created by IMLS and Heritage Preservation.

9. Reach out to non-traditional advocates such as collectors, genealogists, and history enthusiasts to help promote and fund preservation efforts.

10. Link broad preservation awareness programs to emergency response and salvage efforts. Continue to build organizational partnerships among federal agencies for this purpose (e.g. the Federal Emergency Management Agency).

11. Foster collaboration with professional organizations such as the Council on State Archives and ALA. Seek collaborative opportunities with community-based organizations to provide preservation education opportunities.

12. Develop programs to attract young people to advocate, volunteer, and pursue careers in preservation and conservation. Strategies include creating paid summer, work-study, and internship opportunities in preservation. Note observations 4 and 5 in Section F solutions.

13. Attract interest from professionals in allied fields by convening cross-disciplinary meetings for information exchange.

14. Continue to develop and foster strategies to improve the penetration of preservation and conservation information in the basic education of library, archives, and museum professionals, and the addition of key concepts of access continuity and longevity, and other digital curation issues in the training of IT professionals.

15. Develop collaborative programs with state historic preservation offices to connect preservation of the built environment and preservation of the cultural record.

16. Provide "customized" educational resources for preservation and advertise their availability. Identify communities that have preservation interests (scrap-bookers, genealogists) and provide relevant resources suitable to their needs. Identify gaps of preservation/conservation information in allied professions and provide relevant preservation resources suitable to their needs.

17. Consult existing resources, and disseminate and provide assistance to institutions interested in using suggested strategies.

18. Develop strategies to help institutions add preservation awareness to non-preservation events and happenings (concert series, exhibits, oral history initiatives, public lectures, etc.)

19. Create a national annual theme preservation/conservation day on the model of the conservation "May Day." Develop one-minute public service announcements for public television stations, posters for airports, and other public awareness resources. As the success of Antiques Roadshow has shown, infotainment works.

20. See also suggestions in section F, Faculty and Mechanisms for Preservation and Conservation Education.

I. Diversity in the Conservation and Preservation Professions

No survey has ever described the demography of the conservation and preservation fields. Symposium participants were divided in their perception of diversity issues. Some felt there was sufficient diversity if the scan was extended internationally and across disciplines. Others pointed to the very small numbers of Native Americans, African Americans, and representatives of other cultural groups in preservation and conservation jobs and education in the US.

The importance of widespread awareness of cultural heritage preservation issues, the understanding that different communities have disparate sensitivities towards preservation and access, and the value of widely disseminated efforts for preservation awareness and action all suggest that it is desirable to increase the field's proactive recruitment of a diverse population of preservation and conservation workers.

Two key factors that may constitute challenges to conservation, and possibly preservation, careers for students from minority cultural communities. Highly competitive admission requirements, including prior conservation experience and strong academic chemistry preparation, can be difficult to fulfill. Conservation (and preservation) are relatively poorly compensated compared to other professions that require master's level or greater education.

Potential solutions. Although participants did not agree on the need to prioritize cultural diversity in addressing preservation challenges, multiple suggestions were made for activities that might expand representation in the relevant fields. These included the following:

1. Seek input and models from institutions that represent minority cultures, such as the National Museum of the American Indian and the National Museum of African American History and Culture to identify needs and strategies for recruitment and education from those groups.

2. Foster applications for funding for preservation and conservation education and training by IMLS and tribal casinos. Seek opportunities for collaboration with such entities to expand the pool of preservation and conservation professionals.

3. Seek strategies developed elsewhere to empower minority communities to preserve their own cultural heritage (e.g. Canada, Australia, post-custodial approaches, community informatics[23]).

4. Explore opportunities to collaborate with minority cultural institutions and associations such as the American Indian Library Association, the Association of African American Museums, the Hispanic Alliance of Colleges and Universities (HACU), and others.[24]

5. Develop strategies to improve the number and acceptance rate of students representing minority ethnic groups who apply to graduate conservation programs in the US. One sample strategy is offered by New York University's program in film archiving, which prioritizes applicants from diverse backgrounds who indicate willingness to work in underserved communities for some period after graduation, and offers enhanced compensation for internships in institutions representing those communities.

---

[23] Community informatics is a developing discipline with a goal of reaching small, specialized community segments with information to organize, preserve, and provide access to cultural heritage resources that represent them. This discipline, including programs at the University of Illinois and University of Michigan library and information schools, provides opportunities for preservation outreach. The term "post-custodial" is sometimes used to describe such approaches.

[24] The Library of Congress Multicultural Conservation Internships have developed a successful partnership with HACU for summer internships in the Preservation Research and Testing Division.

VI. Summary and Conclusions

Generous funding from the Getty Foundation supported a symposium at the Library of Congress in Washington, DC. Seventy-one senior preservation, conservation, and related education professionals met at the Library on May 15 and 16, 2008, to examine needs, solutions, and priorities for education and training to assure that documentary library, archives, and museum collections are preserved to meet users' needs through the 21st century. Discussions in four special focus discussion groups and plenary sessions identified the following as critical issues and potential solutions:

1. The growth of machine-dependent media including sound recordings, moving images, and digital media demands substantial new skills and knowledge. Challenges include the distinctly different patterns of individual talent and interest that produce conservators, preservation managers, and IT personnel; the tendency to confuse the nature of physical records and mechanisms for virtual access; and demand for and volume of machine-dependent records. Potential solutions include expanding hybrid specializations and improving cross-disciplinary education, collaboration, and coordination among specialists in different fields.

2. Conservation staff fill a broad range of high-order responsibilities ranging from complex treatment of collection objects, to needs assessments and damage prevention, through management, fund-raising, and public education. The breadth of demands can dilute efforts, especially in the not-uncommon settings where one individual must manage all the streams of activity involved in preservation. Potential solutions include developing or expanding hybrid and/or new specializations; expanding curriculum to permit elective courses; and increasing and stabilizing support to preserve collections.

3. Preservation requires policy- and decision-makers to make it a priority for funding and other resources. Challenges include the many competing priorities in libraries, archives, and museums and the constraints of economics in cultural heritage institutions. Market forces are unlikely to assure adequately educated and trained staff for the preservation of documentary heritage collections, which has not shown itself adaptable to cost-recovery or product-oriented models. Preservation and conservation need to sell their importance, and their value as a public good, more effectively. Potential solutions include research to quantify risk; development of data-driven models of return on investment, cost-benefit, and real costs of intervention; and the identification of compelling arguments for relevance to decision-makers outside the field of cultural preservation.

4. The extensive knowledge and hands-on skills conservators apply to treat damaged and at-risk objects across a wide spectrum of machine-independent media (examples include books, paper, photographs, and other "traditional" objects) represent a critical preservation resource. Challenges include the sheer volume of information and experience required for mastery in this field, the economics of conservation education and employment, and impending retirements of senior professionals. Potential solutions include more and better-supported post-graduate fellowships, senior scholar initiatives to preserve expert knowledge, and new technology-assisted education and training resources.

5. Internships and other forms of post-graduate learning are key to strong preparation for the work of preserving documentary cultural heritage materials and assuring their continued access to users. Economic hardships and unstandardized structures may limit the practical availability or quality of these learning experiences. Solutions include increased funding and strengthened systems of coordination, standardization, and access.

6. The universe of faculty for preservation and conservation education is small, and the economics of the disciplines have resulted in the Master's degree as the terminal degree for most professionals, including faculty. As a result, there are few programs providing such education; much preservation and conservation is provided by adjunct, rather than tenured, faculty; courses

benefit from multiple perspectives, but student preparation may be inconsistent or vary as faculty change; and a very small number of sources support high-quality research needed to inform understanding and practice in these fields. Computer and Web-based technologies offer previously unparalleled opportunities for education at all levels from the graduate academic to the local, non-specialized practitioner. They also offer opportunities for continuing education and outreach to new and young populations. The need for additional faculty should be examined, along with avenues of recruitment, funds for research, and the use of new education and training mechanisms.

7. A few topics emerged as critical for more and improved education for a larger and broader population. These include emergency preparedness, strategic planning, and management of digital collections (sometimes called digital curation). Solutions include improved tools for education and information sharing, as well as increased education for information technology and cross-disciplinary collaboration.

8. Discussions of outreach garnered the fullest consensus that a very wide spectrum of people need awareness, if not detailed knowledge, of the importance of preservation and conservation; the nature of "analog" and artifact collections and their relationship to digital collections; and sources of information for identifying, prioritizing, and solving preservation problems. Among the suggestions likely to reach the largest, broadest audiences are the inclusion of basic preservation concepts in education from grammar school through graduate school; customized outreach to specialized communities and populations; mass media programming (e.g. television); and a myriad of highly proactive approaches.

9. There was little consensus on diversity in the preservation and conservation fields or its importance. This may be because no systematic data has ever been collected to document the demography of these disciplines. It may be a priority to collect such data. It is subjectively clear that the fields do not reflect the diversity of the population as a whole, and clear economic and educational barriers exist to expanding preservation and conservation diversity. Some solutions have been mentioned under topic 8, above. Others include the exploration of strategies developed in specialized contexts and other countries (along with data on their effectiveness); proactive networking with multicultural organizations and communities; and the development of strategies to increase acceptance, retention, and graduation in preservation and conservation graduate programs.

VII. Next steps

This report will be made available on the Library of Congress Preservation Web site (see http://www.loc.gov/preserv/symposia/preseduc.html), and disseminated widely to Symposium participants and the field at large. Responses from the field will be invited to validate and further clarify observations and potential solutions, and to identify consensus (if any) about priorities. The Library seeks additional suggestions for how these priorities might best be met.

Such input is vital, since a key issue for progress is the distribution of responsibility for recommended actions. No one institution can assume all responsibility, nor would that be effective strategy for the large-scale and multi-level efforts implied. The Library is currently exploring new sources of funding that might be available to efforts at the national, regional, or local level. Other institutions, including those represented by Symposium participants, must also play a role. The Library seeks suggestions for what these roles might be, and who will take ownership of them.

The Library is engaged in discussions with the Institute of Museum and Library Services about the desirability, structure, and themes of a follow-up meeting to build on results of the original symposium. That follow-up meeting is expected in 2009, and the anticipated focus will be the very high priority area of digital curation. The feasibility of international participation is also being explored.