

NCPTT NOTES

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Remote Sensing in Alaska

Dyea, Alaska 1898. The false front of the small building on the left is still standing and was part of the remote sensing survey. MssSCUA, University of Washington Libraries, Hegg 67.

In collaboration with Klondike Gold Rush National Historical Park in Alaska, NCPTT is supporting the development of a field school for remote sensing techniques. The development and testing of remote sensing techniques have received considerable NCPTT support, and the Dyea project widens NCPTT's work in remote sensing to include training. The project will increase knowledge about the Dyea town site and a portion of Skagway and encourage, through training, the use of current technologies in cultural resources preservation.

In 1897, the discovery of gold in Canada's Yukon brought thousands of fortune hunters to the towns of Skagway and Dyea, Alaska. The White Pass Trail from Skagway and the Chilkoot Trail from Dyea were the most popular overland routes to the gold fields. By 1903, Skagway was nearly deserted. Dyea reached an estimated peak population of 8,000-10,000 then became a ghost town shortly thereafter. Erosion, visitation and the encroaching forest now threaten this important archeological site. Remote sensing has proven to be a cost-effective tool for discovering and interpreting archeological features of both sites.

In July 1999 Dr. David Brauner of the Department of Anthropology, Oregon State University, and James Bell of Pacific Geophysical Surveys Inc. conducted a remote sensing survey in the Dyea town site and on a portion of the Moore block in Skagway. Funded by NCPTT and administered through the Klondike Gold Rush National Historical Park, this work was conducted in preparation for a field school scheduled for summer 2000.

The remote sensing survey focused on the old Dyea cemetery or Native Cemetery, which once separated the lower Dyea town site from the northern or upper town site, the false-front area (roughly 5th and Main Street) of the lower Dyea town site, and the Slide Cemetery in north Dyea. A portion of the Moore block bordering 5th Avenue in Skagway was also investigated.

Two types of remote sensors were employed for the surveys: a White's Electronics "Spectrum XLT" digital discriminating metal detector and a Model SIR-10 Ground Penetrating Radar (GPR) unit. The portable SIR-

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Caption TK

Remote Sensing in Alaska

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10 can detect the position and depth of objects buried in dielectric materials; this model is manufactured by Geophysical Survey Systems Inc. It can be adjusted to scan depths to 80 feet. The GPR is powered by a standard car battery of 12 volts and has an instantaneous readout on a liquid-crystal color monitor. The remote sensors are designed to map subsurface cultural features such as foundations, roadbeds, privies, basements, burials and near-surface concentrations of cultural debris.

The principle behind subsurface radar surveys is that lower-frequency microwaves (radar) are able to penetrate most soil types. The GPR units direct their beams downward into the ground, and subsurface features and/or objects then reflect that radar beam back to the surface. The radar provides a profile view of what is under the antennae.

For optimum perfor-

mance at Dyea and Skagway, a 500-MHz antenna was used. This frequency is considered best for the detection of small, buried features at shallow depths. The settings for the radar controller were modified for soil conditions at the Dyea site, i.e., a mixture of sand and silt soil strata that were well drained. Most of the radar transects conducted at Dyea were with time interval settings of 50 nanoseconds, with some transects repeated at slightly higher and lower settings. The soil types were determined from previous excavations and modern shovel probes.

Numerous subsurface anomalies were detected by the radar in the Native Cemetery and false front portions of the Dyea site. At the Slide Cemetery, the GPR was not able to detect subsurface features or anomalies, probably because of the high content of boulders and cobbles in the soils. These rocks were large enough to back scatter radar to the antenna, blocking soil penetration below them. No radar anomalies were noted adjacent to 5th Avenue on the Moore block in Skagway.

Only a small portion of the western edge of the Native Cemetery remains, as the Taiya River is relentlessly eroding the upper Dyea town site. The radar survey detected what are interpreted as three remaining graves along the western margins of the old cemetery and a large anomaly, which is the site of a relocated burial. A shallow concentration of cultural material was detected just south and east of the old cemetery, possibly representing the location of a structure. This feature will be investigated during the year 2000 field season.

Two GPR and metal detector transects were established in an east/west direction across the false front lot, continuing across Main Street, and across a lot occupied by a general mercantile store on the east side of the street. Investigators are particularly interested in what a radar signature on two developed lots and the intervening streetscape will look like and how material culture is dispersed across these transects. Defining an electronic and radar based street signature will assist future investigators in relocating the poorly understood street network in Dyea. Anomalies that could be interpreted as cellars, privies, foundation features, sidewalk features and refuse disposal areas will be "ground truthed" through subsurface testing during the year 2000 field season.

In this project, NPS resources serve as laboratories for advanced work in preservation research, training and information distribution — work that can benefit cultural resources throughout the country.

— David Brauner
James Bell

Termite Control Workshop in New Orleans

A joint effort of the Research and Training components of the National Center for Preservation Technology and Training (NCPTT) resulted in a workshop examining termite damage at historic sites. This workshop represents a first effort to provide training on termite control techniques developed through collaborative research initiatives begun in 1995 as a PTT Grant to University of Florida.

The National Center for Preservation Training and Technology (NCPTT) partnered with the New Orleans Mosquito and Termite Control Board (NOMTCB) to host a workshop in New Orleans in September to examine new technologies for controlling subterranean and drywood termite infestations in history building and landscapes. NCPTT has been working with NOMTCB since 1995 and has funded a number of new research initiatives.

For three days, workshop participants learned about the nature and extent of the termite problem, recent and emerging technologies for controlling termites, and the future of termite control. Particular emphasis was given to new baiting techniques and their effectiveness in controlling subterranean termite colonies without damaging historic buildings or the environment. Participants represented the National Park Service, the Department of Agriculture, the Army, Air Force, and Navy, national preservation organizations, universities from as far as Hawaii, and the termiticide industry. Three

representatives came from Brazil.

The New Orleans French Quarter is currently being used as the test site for a new national campaign against the Formosan subterranean termite, a voracious species that now infests several states, including Texas, Louisiana, Mississippi, Alabama, Tennessee, Georgia, Florida, South Carolina, North Carolina, Virginia and California.

NCPTT's partner NOMTCB is working in collaboration with the Department of Agriculture's Agricultural Research Service and the Louisiana State University Agricultural Center in Operation Full Stop. Operation Full Stop is a multi-agency program that aims to reduce the population of Formosan termites and dramatically lower the yearly cost of property damage, repairs and control measures.

A relatively recent and promising approach to control termites relies on baiting termites with a slow-acting termiticide. Baiting systems utilize on in-ground stations equipped with monitors (pieces of softwood) to detect termite activity. When termites



Termite damage at Perseverance Hall, New Orleans

are found in a station, the monitoring device is replaced with a tube containing a toxic substance, such as an insect growth regulator that prevents termites from molting. Termites eat or move through the bait and they transfer the growth regulator to the rest of the colony. Entire colonies can be eliminated in a matter of months. Monitoring is continued to determine whether areas remain clear of infestation or become reinfested.

Thousands of these monitoring stations are in place in the French Quarter. The design of the original stations has been adapted so that it can be employed above ground in walls, ceilings and floors. Although bait systems can be more expensive than tradi-

tional chemical treatments, they limit exposure of people and pets to chemicals. As the monitoring stations are placed outside of buildings, there is very little risk to their historic integrity.

NOMTCB led workshop participants on walking tours of the French Quarter and Louis Armstrong Park to demonstrate the bait system and other emerging termite control technologies, such as acoustic emissions detectors and tree boring equipment equipped with video. With the help of NCPTT, termite infestations are being treated in many of the buildings bordering Jackson Square in New Orleans, including the Cabildo, the

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Termite Control Workshop in New Orleans

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Pontalba Apartments, the Presbytere, the Arsenal and Madame John's Legacy House. Perseverance Hall in Louis Armstrong Park also is being treated by the same method.

Other termite treatment options include good home maintenance, termite barriers, fumigation, and a variety of compartmental and local treatments. Home maintenance means making repairs to prevent water damage and eliminating wood that is in direct contact with soil. Termite barriers refer to chemical or physical techniques that create a wall around a structure through which subterranean termites cannot pass. Fumigation involves surrounding the structure with a gas-tight tarpaulin, releasing a termiticidal gas inside the enclosure, and aerating the fumigant after a set exposure time. Compartmental treatments include the use of hot air or liquid nitrogen in small areas to either raise or lower the air temperature to a lethal level for termites. The injection of termiticide into wood, surface application of termiticide, application of microwave energy, electrocution, and wood replacement are examples of local treatments.

These methods and ongoing research will help investigators develop safer and more effective treatments for termite control. NCPTT will continue to collaborate with leading researchers and organizations to research, develop, and distribute technologies that will lead to the preservation and conservation of cultural heritage resources in the United States.

For additional information on this workshop see "Enemies in the Earth," *Old House Journal*, February 2000, 54-57.

Formosan termites

Experts estimate that the yearly cost of controlling termites in the United States is about \$1.5 billion. This figure would increase drastically if costs for repairing termite damage were included. The key termite pests in this country are three subterranean species and one less common drywood species.

The eastern subterranean termite, *Reticulitermes flavipes* (Kollar), and the western subterranean termite, *Reticulitermes hesperus* (Banks), are native to the United States and are important structural pests. The Formosan subterranean termite, *Coptotermes formosanus* (Shiraki), is an introduced species. Relative newcomers, Formosans arrived with military ships returning from the Pacific after WWII. Unlike native species, Formosan colonies are large and may



contain millions of termites capable of foraging over great distances. For this reason they are a significant threat to wood structures. Unless controlled, the Formosan termite will likely spread to cities throughout the temperate zone.

Unlike subterranean termites, drywood termites live entirely within the wood members they infest and obtain water from wood fibers. *Cryptotermes brevis*, the most widespread drywood termite in the tropics worldwide, also infest furniture such as headboards, cabinets and picture frames.

NCPTT Web

The NCPTT Web site project is nearly complete. The databases are accessible via the Resources page at NCPTT's Web site <www.ncptt.nps.gov> or via the URLs listed below. Each database can be queried by a simple keyword search. Users also can suggest additions to each database or notify NCPTT of changes to current listings by completing a form available at each query screen. Suggestions and revisions are encouraged.

The final elements of the project include an online searchable database of PTTGrants and PTTProjects, an online bibliography from NCPTT's Materials Research Program and a searchable database of *Directory of Analytical and Materials Testing Services for Historic Preservation*.

Preservation Internet Resources

www.ncptt.nps.gov/pir
Includes Web sites, ftp sites, telnet sites, listservs and usenet groups

Training and education opportunities

www.ncptt.nps.gov/teo
Includes degree programs, workshops, internships, fellowships and field schools

Job openings

www.ncptt.nps.gov/jobs

Conferences/calls for papers

www.ncptt.nps.gov/conferences

Funding opportunities

www.ncptt.nps.gov/fundingopps



NCPTT Supports AIC's Electronic Media Group Session

NCPTT provided critical support for the June inaugural meeting of the Electronic Media Group, which was part of the 27th Annual Meeting of the American Institute for Conservation of Historic and Artistic Works (AIC) in St. Louis. NCPTT's support provided an opportunity for discussion concerning new technologies in digital photography, digital video, and development of digital film.

Formally recognized by the AIC board in the fall of 1998, the Electronic Media Group joins nine other specialty groups devoted to the preservation of broad categories of artistic and historic media such as paintings, architecture, photographs, works on paper and wooden artifacts. Through the Electronic Media Group, the membership of AIC intends to demonstrate its continued commitment to the preservation of the broad spectrum of material culture.

An increasingly important manifestation of this commitment is the preservation of electronic media held by cultural organizations such as museums, archives and libraries. Part of the challenge lies in maintaining continuity with past technologies in the face of constant technological innovation. An artistic work made today may be inaccessible or substantially altered in a matter of years due to a host of problems, including media deterioration and obsolescence of the file format or hardware.

In addition to preserving electronic art and cultural material, the Electronic Media Group is a forum for conservators and related professionals to develop and maintain knowledge of relevant new media and emerging technologies. The NCPTT-supported EMG meeting in St. Louis made for a promising start by reaching a diverse group of conservators gathered from across the country and from other nations.

The Electronic Media Group sessions in St. Louis consisted of two major components. First, there was a full day of 20-

to 30-minute talks, primarily given by conservators and related professionals on topics ranging from the documentation and preservation of installation art to the potential of digital photography as an artistic medium. This session included the following topics and speakers:

- Cleaning Techniques Used in Videotape Restoration: A Preliminary Study by Mary T. Baker, Ph.D., and Sarah D. Stauderman;
- Technological Challenges in the Museum: Installation and Maintenance of the Multi-Media Work of Tony Oursler at the Williams College Museum of Art by Monica DiLisio Berry;
- Photography Conservation Training Via Videoconference: A Project Report by Irene Bruckle and Paul Messier;
- The Development of a Paint Cross Section Database by Bradford Epley;
- Using Radio Telemetry For Light, UV Temperature and Humidity Monitoring by Martin Hancock, Ph.D.;
- Digital Techniques for Image Recovery Applied to Gelatin Glass Plate Negatives by Jill Koelling;
- Image Permanence and Care of Digitally-Produced Prints by Mark McCormick-Goodhart and Henry Wilhelm;
- Planning for and Costs of Digital Imaging Products by Steven Puglia;
- Conservation Lessons Learned from the National Digital Library, Library of Congress: Preservation Implications of Large Digitization Projects by Ann Seibert, Mary Wootton, Alan Haley,

Yasmeen Khan and Andrew Robb; and
• Light Levels Used in Modern Flatbed Scanners by Timothy Vitale.

Full abstracts for these talks are available from the Electronic Media Group Website at http://aic.stanford.edu/emg/st_louis_meeting.html.

The following day, the Electronic Media Group's Digital Discussion Group held a half-day of talks and demonstrations on the special interest topics of digital imaging for conservation documentation and the technical history of video. Acknowledged leaders in the field of video production, digital photography, color management, digital printing and printing ink manufacture led this session. A founding premise of the Electronic Media Group is that conservators cannot approach issues relating to new technology in isolation and that conservators must continually engage prominent members from various fields to present their insights on the inherent problems and potential solutions for the preservation of electronic culture.

Through the support of the National Center for Preservation Technology and Training, Tim Vitale, session chair for the discussion group, invited experts including:

- Stephen Johnson of Stephen Johnson Photography said that digital photography has crossed a quality threshold and is now a far better photographic imaging medium than film. He demonstrated the Calumet BetterLight 6000 X 8000 pixel scanning digital back with a 4x5 camera and showed that the results were better than the resolution and dynamic range of film. (The scanning digital back replaces the conventional film holder.)
- Jeff Ball of Lyson Specialty Fluids covered the formulations for light-stable inkjet inks for making inkjet prints, including IRIS prints, and discussed ink formulation specifics and the technical history and challenges inherent in making permanent digital hardcopy.

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New Surveillance Technologies

Looting and vandalism of archeological sites pose significant difficulties for park rangers and law enforcement agencies who must protect thousands of sites spread over vast areas as well as underwater archeological sites previously inaccessible to most thieves. Recognizing the need for dissemination of information of new surveillance technologies, the Research and Training components at NCPTT joined to sponsor a forum for discussion and debate on the subject.

NCPTT joined the Coastal Systems Station (CSS) of the US Naval Surface Warfare Center and the University of West Florida to host a roundtable discussion of new technologies for the protection of remote archeological sites. Representatives from the National Park Service, CSS, US Forest Service, NASA, several universities, and the surveillance industry, met July 21-22 at the CSS in Panama City, Florida. Topics included transferring existing surveillance technologies to the preservation of cultural resources, reducing the cost of these technologies, training in the use of these technologies, and coordinating future research. Several issues are described in the article below.

Coastal Systems Station, Naval Surface Warfare Center

The Coastal Systems Station, the Navy's primary organization responsible for mission support on the coasts, works with industry to provide research, development, testing, acquisition and in-service en-

gineering support to Navy Program Sponsors and Fleet Units. CSS's expertise in developing technology for detecting mines and debris and for



Surveillance cameras at Joshua Tree National Park

autonomous surveillance is of particular interest to archeologists.

An example of technology that has obvious application for archeologists is the Mobile Underwater Debris Survey System (MUDSS). Originally designed for surveying aban-

doned underwater defense sites for ordnance and explosive waste, MUDSS holds promise for the detection and surveying of underwater archeological sites. It consists of a non-magnetic catamaran equipped with a super-conducting magnetometer, sonar, synthetic aperture sensors, an electro-optical imager, and a gradiometer (magnetometer that gives range and distance as well as magnetic force). MUDSS is especially useful for conducting surveys as it tracks location. It is a sophisticated system, and this is reflected in its multimillion-dollar price tag.

Recently, CSS has developed a new system that has potential application for both

phone buoy was placed in Panama City Bay. The hydrophone transmitted audio signals to a receiver in the classroom, where an operator listened for suspicious sounds. When the operator heard a boat approach and stop near the buoy, he sent a remote controlled helicopter with a video camera and a transmitter to investigate. In this way, the operator and participants were able to assess the activity at the remote site without ever leaving the classroom.

State of the Art

To date, only a handful of underwater archeological sites have employed surveillance systems to protect against looting and salvage. For the most part they have relied upon the expertise and goodwill of the US Navy and Coast Guard for operational support and maintenance of the surveillance equipment. The CSS Hunley and USS Monitor shipwrecks are two places where security measures have been implemented. Unfortunately, the surveillance systems deployed are expensive and not commercially available.

A range of seismic, magnetic and passive infrared sensors has been used in recent years to detect and monitor activity at several terrestrial sites at various national parks and monuments. Waputki National Monument, for example, uses sensors connected to electronic alarms that alert rangers when a site is disturbed. These surveillance systems are readily available and user-friendly and require minimal training. When properly deployed, these surveillance systems have significantly decreased vandalism

and looting. However, they are too expensive to be deployed at all archeological sites. These systems also require maintenance and at present lack real-time video capability that would allow rangers to view activity at the site when an alarm is triggered. This is critical to reducing false alarms and to bringing successful prosecutions.

Future research and development

Final discussions centered on steps NCPTT should take to further develop issues introduced by the participants, and a strategy was developed to advance the protection of archeological resources:

- Identify existing surveillance technologies
- Identify key stakeholders
- Identify requirements and specifications for archeological applications
- Coordinate and facilitate field trials to evaluate surveillance technologies
- Develop new surveillance technologies for archeological application
- Act as a clearinghouse to share information about and promote the use of surveillance technology to protect archeological resources

Looting and vandalism of archeological sites is a significant problem in the United States today. Whether for profit or recreation, stealing from archeological sites is particularly senseless and robs all Americans of their cultural heritage. The difficulties facing those who protect and manage our cultural heritage are enormous. Park rangers and law enforcement agencies

in the western United States must protect thousands of archeological sites spread over vast areas. With the rapid growth of deep-water technology, underwater archeological sites are at greater risk than ever. Shipwrecks, such as the USS Monitor, that were once thought safe from looting due to their remoteness (16 miles offshore and 240 feet underwater) are now vulnerable.

If technology is going to play a greater role in protecting archeological resources against looting and vandalism, the historic preservation community must work more closely with the surveillance industry and individual companies to adapt their products for use in archeology and to integrate new components into their existing products. They must also work together to cre-

ate a market for these products. Costs can be reduced only if products can be purchased off the shelf. Initially, these research and development costs may have to be borne by the historic preservation community.

For further information about this workshop, contact Dr. Mark Gilberg, Research Coordinator, NCPTT.

NCPTT Supports AIC's Electronic Media Group Session

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- Andrew Rodney, digital prepress and Photoshop consultant, addressed color management issues, suggesting strategies by which color fidelity for digital images can be maintained over time and over a range of monitors and printers. A mastery of color management issues will emerge as critical to preserve the integrity of digital images over the long term.
- Luke Hones, correspondent for DV Magazine and director of Artist Television Access, discussed the evolution of digital video formats with special emphasis on the technical history of video.

Additional details about this session can be found on the Electronic Media Group Website at <http://aic.stanford.edu/emg/scanning.html>.

The 28th AIC Annual Meeting will take place in Philadelphia June 7-13, 2000, and the general session will focus on the preservation issues relating to electronic media. The meeting will also explore the impact of new technology on the way conservators perform fundamental tasks.

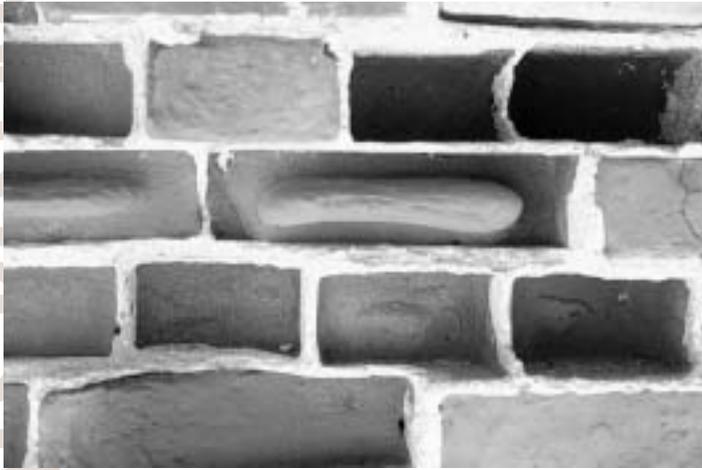
For more information about the Electronic Media Specialty Group or AIC, contact AIC, 1717 K Street NW, Suite 200, Washington, DC 20006, 202-452-9545, fax 202-452-9328, <http://aic.stanford.edu>.

— Elizabeth F.

“Penny” Jones

Paul Messier

Ms. Jones is executive director of AIC. Mr. Messier is chair of Electronic Media Group of AIC.



An example of how an inappropriate replacement mortar can accelerate brick deterioration.

A Standard Method for the Analysis of Historic Cementitious Materials

Two University of Delaware researchers, Elizabeth Goins and Chandra Reedy, are developing a standard protocol for the analysis of historic mortars through 1998 and 1999 PTTGrants. The project, in its second year, is nearing completion. Test procedures for the protocol include thin section analysis, SEM-EDS analysis, and XRD analysis, among others. Currently, validation of the protocol is under way using laboratory samples of 18 traditional mortar recipes. This article describes the need for a new protocol for historic mortar analysis.

Historic mortar, cement and plaster (collectively referred to as historic cementitious materials) are analyzed by a number of wet chemical and instrumental techniques. These materials can range from ancient Roman aqueduct linings made of lime and crushed brick to Portland cement bridges constructed in the early years of the 20th century. The wide variety of materials, construction techniques and degree of deterioration peculiar to historic, as opposed to modern,

cementitious materials call for standard methods of analyses tailored for conservation and preservation needs.

In the past, mortar and cement analyses depended on wet chemical methods to determine bulk oxide components. Basically, these analyses consist of determining the amounts of silicon and calcium oxides soluble in acid. The problem with the bulk oxide analyses is that they are indirect. Stewart and Moore (1981) carried out a thorough study of three chemical tech-

niques on laboratory prepared mortar samples. They found that all three methods failed to accurately determine the original composition. The main problem was that the techniques could not distinguish between different sources of soluble silica. They also are invalid if calcareous aggregate is present. This fault was recognized by practitioners, and ASTM C 1324-96 notes the problem: "Some historic mortars may contain non-resolvable constituents that may interfere. However, significant information may be obtained by petrographic examinations."¹

An informal Internet survey was conducted by the author (Goins 1999), focusing on the materials and the techniques used in the analysis of historic cementitious materials. Thirty-three professionals, ranging from engineers to conservation scientists, responded. An important point of this survey is that the only standard method for examination and analysis of hardened mortar, ASTM C 1324, is not used. In fact, as figure 1 illustrates, a number of different approaches are used, but the most commonly employed is based on the method developed by Jedrzejewska (1960). Protocols developed by the Portland cement industry, like ASTM C 1324, do not consider issues that are important in the analysis of historic cementitious materials. In fact, their usage can contribute to misinterpretation, con-

fusion and misuse of the analytical results. As an example, chemical analyses are often relied on to determine the proportions of the original mix (that is, volume proportions of sand, lime etc.). Determining the original mix ratios is not academic since replacement mortars are often specified to match the original mortar.

This is contrary to the conservation and preservation teaching, which clearly states: "While historic mortar mixes may be established by modern analyses it is often academic and even inadvisable to use such mixes in repointing or repairing masonry which has survived the ravages of time and the environment in a weakened or deteriorated condition. The original mixes may simply be too strong for the old masonry units.... As a general principal the mortar should always be slightly weaker than the masonry...."²

The methodology for the determination of replacement mortars instead should be based on the testing of certain physical and structural parameters like mechanical strength and porosity. The analysis of historic cementitious materials clearly calls for the development of a new protocol that considers the parameters important to conservation and preservation. Ideally, this protocol would consider the practical needs of restoration as well as the somewhat different requirements of the academically focused research project.

¹ ASTM C 1324-96, "Standard Test Method for Examination and Analysis of Hardened Masonry Mortar" (Philadelphia: American Society for Testing and Materials, 1996).

² Weaver, M.E., and F.G. Matero. Chapter 7, "Cementitious Materials," in *Conserving Buildings* (New York, John Wiley & Sons, 1993).

Publications such as ASTM STP 1258 and conferences, such as *International Workshop Historic Mortars*, that include collected papers of state-of-the-art analytical techniques have attempted to address the need for a standard protocol. However, a standard method that is based solidly on conservation guidelines and ethics and considers the unique aspects of these materials has not been published to date.

A protocol is typically described as a set of procedures, agreed upon by the professional field at large, that includes the methods that best characterize a material and allows for its interpretation within that field. An ideal protocol would be tailored to the needs of that field to standardize the quality of the analyses and to clearly define common analytical objectives. In order to accomplish this, there must be a clear understanding of the problems at hand. While there has been a tremendous amount of research in the development of modern cement, there has been surprisingly little basic research on traditional and historic cementitious materials. Historic preservation, conservation and archeology have goals very different from those of the construction industry.

Analytical project goals can be broken into two major classes. The first is the practical side — conservation or restoration. Here the expense of the analysis is typically of major concern. The priority may lie in preserving the structure, not in detailed analysis of the materials. Typically, the analytical focus is on finding compatible mortars (best carried

out by determining the physical characteristics of the structural units, as described previously) and perhaps matching the aggregate. The second class is the detailed research project. Important structures and archeological sites often call for extensive research. The analytical goals might be to study the technology, date the structure or otherwise assist in answering more academic questions.

The study of the petrographic section (St. John et al. 1998), both by reflected and transmitted light, provides information on the mineral phases, interactions and microstructure that are responsible for imparting characteristic properties to cement. These techniques have been increasingly used to describe and characterize historic cementitious materials. Survey (Goins 1999) results show that petrographic analytical techniques play an important role in the study of historic cementitious material (figure 2). However, the success of a thin section analysis is critically dependent on the selection of appropriate samples, sample size and number, and the petrographer's skill. However, 60 percent of the respondents said that they only *sometimes* followed a sample-taking procedure. The reason is that those most knowledgeable about the procedure, the person(s) conducting the analysis, are often not involved in sample determination or retrieval.

A new protocol for the analyses of historic cementitious materials, designed to meet the needs of historic preservation and conservation, is needed. A combined

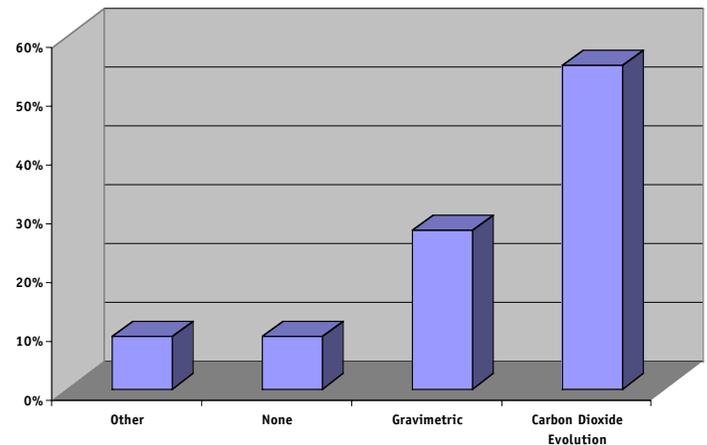


Figure 1: Chart of Internet survey results. This chart shows relative use of protocols for chemical analysis of historic cementitious materials.

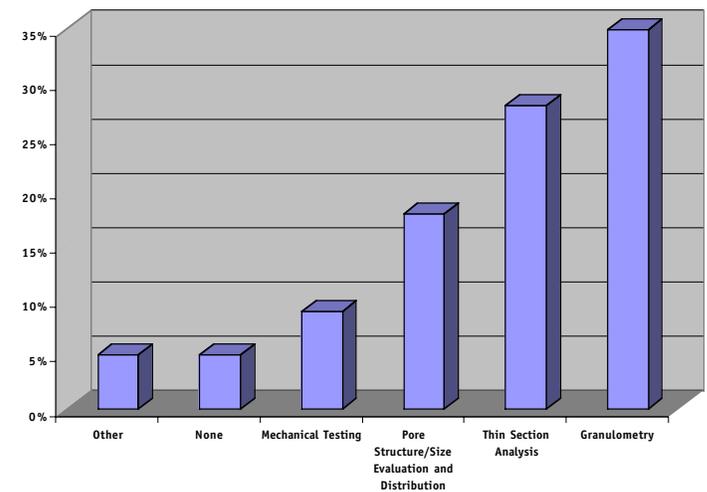


Figure 2: Chart of Internet survey results. This chart shows techniques used for analyzing historic cementitious materials.

strategy incorporating the best methods of sampling and analyses is vital for valid interpretation of the raw data. Per-

haps then mortar analysis will move from being an expensive luxury to an important tool.

—Elizabeth Goins

April - August 2000

NCPTT welcomes calendar items, but only items with a minimum two-month lead will be considered for publication. A more extensive listing of conferences, training and other preservation events is available in the Resources section of NCPTT's Web site <www.ncptt.nps.gov>.

April

- 3-8 Caring for Collections** workshop in Victoria, Canada, sponsored by University of Victoria. For information, contact Cultural Resource Management Programs, University of Victoria, PO Box 3030 STN CSC, Victoria, British Columbia V8W 3N6, Canada; telephone 250/721-8462, facsimile 250/721-8774, e-mail <bweatherston@uves.uvic.ca>, Web <www.uves.uvic.ca>.
- 5-7 Collections Maintenance** workshop in Andover, Massachusetts, sponsored by the Northeast Document Conservation Center, third of a series of five "Managing Preservation" workshops that continue June 1-2 and September 21-22. For information, contact Steve Dalton or Karen E. K. Brown at NEDCC, 100 Brickstone Square, Andover, MA 01810-1494; telephone 978/470-1010, facsimile 978/475-6021, e-mail <dalton@nedcc.org>, Web <www.nedcc.org/coord.htm>.
- 5-9 Society for American Archaeology** conference in Philadelphia, Pennsylvania. For information, contact Winifred Creamer, Society for American Archaeology, 900 Second Street NE #12, Washington, D.C. 20002-3557; telephone 202/789-8200, facsimile 202/789-0284, e-mail <meetings@saa.org>, Web <www.saa.org>.
- 6-9 US/ICOMOS 2000** symposium in Indianapolis, Indiana, sponsored by International Council on Monuments and Sites. For information, contact International Council on Monuments and Sites; telephone 202/842-1866; Web <www.icomos.org/usicomos>.
- 8 Preservation of Architectural Terra Cotta** workshop in New York, New York, sponsored by New York Landmarks Conservancy and National Center for Preservation Technology and Training. For information, contact New York Landmarks Conservancy, 141 Fifth Avenue, New York, NY 10010; telephone 212/995-5260, facsimile 212/995-5268, e-mail <nylandmarks@nylandmarks.org>, Web <www.nylandmarks.org>.
- 9-11 Introduction to Section 106 Review** workshop in Philadelphia, Pennsylvania, sponsored by University of Nevada-Reno. For information, contact Division of Continuing Education, University of Nevada-Reno, Reno,

NV 89557; telephone 800/233-8928, e-mail <crystaln@unr.edu>, Web <www.dce.unr.edu/hrm/hrmnew.htm>.

- 10 An Introduction to Historic Building Materials** workshop in St. Louis, Missouri, sponsored by National Preservation Institute. For information, contact Jere Gibber, National Preservation Institute, PO Box 1702, Alexandria, Virginia 22313; telephone 703/765-0100, e-mail <info@npi.org>, Web <www.npi.org/sem-hbhtml.html>.
- 11 Historic Structures Reports & Computer-Aided Facilities Management Programs** workshop in St. Louis, Missouri, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-hsr.html>, or see April 10 entry.
- 11-12 Accessibility and Historic Integrity** workshop in Madison, Wisconsin, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-access.html>, or see April 10 entry.
- 12-13 Integrated Cultural Resource Management Plans: Preparation and Implementation** workshop in St. Louis, Missouri, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-icrmp.html>, or see April 10 entry.
- 14 Practical Application of the Secretary of the Interior's Standards for the Treatment of Historic Properties** workshop in St. Louis, Missouri, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-stand.html>, or see April 10 entry.
- 16-19 Museums and the Web 2000** conference in Minneapolis, Minnesota, sponsored by Archives and Museums Informatics. For information, contact Archives and Museums Informatics, 2008 Murray Avenue Suite D, Pittsburgh, PA 15217; telephone 412/422-8530, facsimile 412/422-8594, e-mail <mw2000@archimuse.com>, Web <www.archimuse.com/mw2000/>.
- 17 Field Conservation for Archaeologists** workshop in Mount Vernon, Virginia, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-field.html>, or see April 10 entry.

18-19 Consultation with Indian Tribes on Cultural Resource Issues workshop in Riverside, California, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-tribe.html>, or see April 10 entry.

25-26 Section 106: Working with the Revised Regulations workshop in Honolulu, Hawaii, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-106rr.html>, or see April 10 entry.

May

- 1-5 African Americans, Hispanic Americans, & Resources in National Parks** workshop in Harpers Ferry, West Virginia, sponsored by National Park Service. For information, contact Stephen T. Mather Training Center; National Park Service, PO Box 77, Harpers Ferry, WV 25425-0077; telephone 304/535-6178.
- 3-5 Architectural Records - Preserving and Managing the Documentation of our Built Environment** conference in Philadelphia, Pennsylvania, sponsored by Conservation Center for Art and Historic Artifacts. For information, contact Conservation Center for Art and Historic Artifacts, 264 South 23rd Street, Philadelphia, PA 19103; telephone 215/545-0613, facsimile 215/735-9313, e-mail <CCAHA@ccaha.org>, Web <www.ccaha.org>.
- 5 Nondestructive Evaluation Methods** workshop, sponsored by American Institute of Architects Continuing Education and National Center for Preservation Technology and Training. For information, contact AIA Continuing Education Department, 1735 New York Avenue, NW, Washington, DC 20006-5292; telephone 202/626-7353, facsimile 202/626-7425, e-mail <Colee@aiaemail.aia.org>.
- 5 Safeguarding Our Heritage** workshop in Philadelphia, Pennsylvania, sponsored by AIA Continuing Education and National Center for Preservation Technology and Training. For information, contact AIA Continuing Education Department, 1735 New York Avenue NW, Washington, DC 20006-5292; telephone 202/626-7353, facsimile 202/626-7425, e-mail <Colee@aiaemail.aia.org>.
- 12-13A Balancing Act: Management of the Historic House Museum and Its Collections** workshop in Baltimore, Maryland, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-musm.html>, or see April 10 entry.
- 14-17 Canadian Association for Conservation of Cultural Property** conference in Ottawa, Canada. For information, contact Canadian Association for Conservation of Cultural Property; telephone 613/998-3721, facsimile 613/

998-4721, e-mail <jane_sirois@pch.gc.ca>, Web <www.cac-accr.ca/econcall.html>.

15-19 Introduction to Managing NPS Legacy Information workshop in Austin, Texas, sponsored by National Park Service. For information, see May 1-5 entry.

17-20 Symposium 2000—Conservation of Heritage Interiors, in Ottawa, Canada, sponsored by the Department of Canadian Heritage. For information, contact Department of Canadian Heritage, Canadian Conservation Institute, 1030 Innes Road, Ottawa, Ontario, Canada; telephone 613/998-3721, facsimile 613/998-4721, e-mail <james_bourdeau@pch.gc.ca>, Web <www.pch.gc.ca/cci-icc/>.

17-20 Traditional Historic Masonry Preservation workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, contact Campbell Center for Historic Preservation Studies, 203 East Seminary, Mount Carroll, Ill 61053; telephone 815/244-1173, facsimile 815/244-1619, e-mail <campbellcenter@internetni.com>, Web <www.campbellcenter.org>.

22-26 Cultural Resources 2000: Managing for the Future conference in Santa Fe, New Mexico, sponsored by National Park Service. For information, contact National Park Service, 1849 C St. NW, Washington, DC 20240; Web <www.nps.gov>.

24-29 Focus on the Learner conference in Victoria, British Columbia, sponsored by International Committee for Training of Personnel (ICTOP) - International Council of Museums (ICOM). For information, contact Web <www.city.ac.uk/ictop/ictop-victoria.html>.

June

1-2 Selection for Preservation workshop in Andover, Massachusetts, sponsored by Northeast Document Conservation Center. For information, see April 5-7 entry.

9-10 AIC 28th Annual Meeting in Philadelphia, Pennsylvania, sponsored by American Institute for Conservation of Historic and Artistic Works. For information, contact American Institute for Conservation of Historic and Artistic Works, 1717 K Street NW, Suite 301, Washington, DC 20006; telephone 202/452-9545, facsimile 202/452-9328, e-mail <InfoAIC@aol.com>, Web <http://palimpsest.stanford.edu/aic/>.

23-24 Accessibility and Historic Integrity workshop in Mount Carroll, Illinois, sponsored by National Preservation Institute. For information, contact Web <www.npi.org/sem-access.html>, or see April 10 entry.

26-28 Ornamental Plaster workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

July

10-14 Society for the Preservation of Natural History Collections meeting in Halifax, Nova Scotia, sponsored by Society for the Preservation of Natural History Collections. For information, contact Suzanne B. McLaren, Society for the Preservation of Natural History Collections, PO Box 797, Washington, DC 20044-0797; Web <www.uni.edu/museum/spnhc/>.

12-15 Care of Works of Art on Paper workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

25-29 Stabilization & Maintenance of Historic Structures workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

August

9-12 Researching Historic Building Interiors workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

10-12 Care of Photographic Collections workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation. For information, see May 17-20 entry.

12-17 Preserving Photographs in a Digital World workshop in Rochester, New York, sponsored by Rochester Institute of Technology. For information, contact Technical and Education Center, Rochester Institute of Technology, 66 Lomb Memorial Drive, Rochester, NY 14623-5604; telephone 800/724-2536, facsimile 714/475-7000, e-mail <webmail@rit.edu>, Web <http://yellowstone.cims.rit.edu/T&E/index02.html>.

21-25 Recent Advances in the Conservation of Silver workshop in Omaha, Nebraska, sponsored by Ford Conservation Center and National Center for Preservation Technology and Training. For information, contact Lisa Metzger Grotrian, Ford Conservation Center, 1326 South 32nd Street, Omaha, NE 68102; telephone 402/595-1180, facsimile 402/595-1178.

21-25 Protecting Archeological Resources Through Sensitive Landscape Management workshop in Boston, Massachusetts, sponsored by National Park Service. For information, see May 1-5 entry.

23-24 Preservation of Archival Collections workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

24-26 Photographic Documentation of Collections workshop in Mount Carroll, Illinois, sponsored by Campbell Center for Historic Preservation Studies. For information, see May 17-20 entry.

Autumn Grant joins NCPTT

Autumn Grant recently joined NCPTT as Training Assistant, and she is maintaining the Training and Education Opportunities database at the NCPTT website. This project involves research and input of both long-term and short-term programs related to preservation issues. Grant holds a BA in History from Louisiana Tech and is working on an MA in History/Cultural Resource Management at Northwestern State University.

Prior to her work at NCPTT, Grant participated in a number of CRM projects. She was part of a Louisiana Tech crew to locate specific sites at Camp Ruston, a WWII German POW camp. She participated in the Louisiana Tech Rome Study Abroad program, studying history and archeology in Italy. Recently, Grant worked on an archeological survey of Camp Beaugard in Pineville, Louisiana, sponsored by the NSU Conservation Lab.

Our Mission

United States Department of the Interior

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and to honor our trust responsibilities to tribes.

National Park Service

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education and inspiration of this and future generations. The Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

National Center for Preservation Technology and Training

The National Center for Preservation Technology and Training promotes and enhances the preservation of prehistoric and historic resources in the United States for present and future generations through the advancement and dissemination of preservation technology and training.

NCPTT, created by Congress, is an interdisciplinary effort by the National Park Service to advance the art, craft and science of historic preservation in the fields of archeology, historic architecture, historic landscapes, objects and materials conservation, and interpretation. NCPTT serves public and private practitioners through research, education and information management.

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