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Inside

In Remembrance
September 11, 2001

Decontamination in Conservation

Dennis Ertel

Over time, many cultural objects are exposed to various environmental hazards and thus become contaminated with residual materials. This contamination can occur both intentionally and unintentionally. The intentional application of preservatives, pesticides, insecticides, and fungicides, and other chemical compounds can result in an environmental hazard. Unintentional contamination of cultural property can occur through the gradual deterioration of hazardous building materials (such as asbestos), air pollution (such as lead and oxides of sulfur and nitrogen) and the introduction of biological contaminants (such as fungi or bacteria). Unintentional contamination can also result from catastrophic accidents.

In the past few decades, conservators have begun to take interest in the special needs of cultural materials that are contaminated with environmental hazards. Recognition of potential health problems from solvent exposure has resulted in more interest in safe work practices and safe chemical choices. Identification of past pest control practices has led to current interest in issues surrounding the use of pesticide-contaminated cultural property. Awareness of human health problems caused by biological contaminants such as mold has increased interest in safe remediation practices. Changes in the regulations surrounding the handling of such materials as lead and asbestos have resulted in different approaches to conservation treatment. The terrorist attacks of September 11 on the World Trade Center and the Pentagon greatly impacted the awareness of conservators to the conse-

continued on page 3

Certification: Moving Ahead

Summary of the Issues Session, Annual Meeting

Pamela Young

The issues session was very well attended at the Annual Meeting in Miami. Jerry Podany began with a brief overview of past efforts to establish a certification program within AIC. As members of AIC, we have long wanted to increase the status of our profession, but our natural tendency toward obsession with detail and perfection sometimes impedes efficiency in deciding larger issues. The hesitation to move ahead without answers to every question can't be an obstacle to our ability to better serve the world's cultural heritage. We have to take some chances, and we have to move forward.

At present, there is no conventional method for judging the qualifications and aptitude of one who calls himself or herself a conservator, no formal category that recognizes the accomplishments of an individual who has met the minimum requirements to practice this profession. As one audience member remarked, "the federal government still doesn't recognize conservation as a profession... we need the credibility."

Terry Drayman-Weisser, chair of the Certification Task Force, underscored the definition of certification as a nongovernmental, voluntary procedure. At a previous issues session meeting, the membership voted for the Task Force to continue to investigate development of a certification program for practicing conservators and produce a model program. Terry summarized the description of

continued on page 5

Decontamination continued from page 1

quences of unintentional deposition of environmental hazards on all sorts of materials including cultural property.

Conservators have responded in a variety of ways to both events of September 11 and other circumstances where there is environmental contamination. Larger organizations, such as the Smithsonian Institution, have long recognized the potential presence of environmental contaminants associated with cultural property and have developed and implemented programs to evaluate the presence of contamination and to decontaminate and validate the clean up of the hazards when appropriate. In recent years, several conferences have explored issues surrounding pesticide residues on cultural property. These meetings have served to raise consciousness and to initiate further research on identification, risk assessment, and potential solutions. In response to the events of September 11, conservators and health and safety professionals undertook outreach and educational efforts to inform others within the conservation field about reasonable precautions to take in dealing with potentially contaminated cultural property by sending a packet of information to conservators in the NYC region. This packet included short articles by Mary Ballard, Kathryn Makos, Monona Rossol, and Chris Stavroudis, and was sent courtesy of SCMRE to members of NYRAC.

As a result of discussions about contamination from September 11, members of the Health and Safety Committee realized that there is a basic need for more formal health and safety training in issues of environmental contamination. A subgroup of the H & S Committee working on safety training curricula realized that many of the safety issues for airborne environmental contamination are similar, regardless of the contaminating agent. It became clear that a workshop could become an important vehicle for disseminating information on the decontamination from many types of environmental hazards. This workshop was held at the AIC Annual Meeting in Miami.

The workshop included an explanation of toxicology of particulate contaminants, a case study in cleaning methods for decontamination, and a description of testing protocols for determining both risk associated with the contaminants and success in cleaning efforts.

Health Risks and Toxicology

Dr. David Goldsmith, an environmental epidemiologist, spoke to the workshop audience about the risks associated with exposure to environmental hazards. He focused on the relationship between disease and contaminant exposure. Specifically he described the possible health effects of exposure to various particulates or dusts, some gaseous chemicals, and pesticides with regard to the respiratory system.

The most serious disorders include well pneumoconioses (roughly translated to dusty lung disorders) such as silicosis, asbestos, and coal workers' pneumoconiosis. Other serious consequences that may be related to high exposures to particulate matter include lung cancers. Exposure to elevated concentrations of gaseous chemicals may lead to reactions such as sensitization, irritation, inflammation, and asphyxia. Gases may be present in the form of volatile organic chemical vapors or gases, or in the form of non- or semi-volatile chemicals attached to other particulate matter.

Dr. Goldsmith also spoke about pesticides, their toxicology, and risks of exposure to these chemical agents. Conservators encounter pesticides in both the application of pesticides and in working with cultural property that may have had one or more pesticides applied in the past. Use patterns have changed over the years for many reasons including the health of the individuals applying the pesticides, but for many older pieces of cultural property, residual pesticides may still be present. The toxicological properties of pesticides are as diverse as the types of chemicals used over the years and include neurological conditions, central nervous system conditions, sensitization, irritation, and many other health effects.

Dr. Goldsmith reviewed the best defenses to limit the likelihood of occupational lung diseases and harmful exposures to pesticides, including good health and safe "standard operating procedures" (SOPs), a proper evaluation of the hazards at a work site; and, when appropriate, medical monitoring and personal protective equipment suited to the observed hazards.

A Case Study in Decontamination Protocols, Building 17

Ginger Deucher presented a slide show describing the decontamination of cultural property from asbestos at a Smithsonian Institution storage facility called Building 17. The project is described in more detail in her article (*JAIC* 39[1] 2000). The stated goal of the project was to make 1,000,000 asbestos-contaminated objects accessible to conservators, museum staff, researchers, and possibly the public. Along the way, staff members were required to work with the industrial hygiene staff in order to assess the type and level of contamination, damage to collections, and efforts necessary for each task.

One of the overriding issues for this project was the way that conservation practices were meshed with the practices of the asbestos abatement industry. The planning was extensive and included conservators, collections storage managers, industrial hygienists, safety staff, construction managers, museum administrators, and asbestos abatement contractors. In order to send museum staff into the asbestos abatement area, museum staff members participated in a medical monitoring program, a respiratory protection program, and were provided with health and safety training for work with asbestos, the use of respirators, and other personal protective equipment.

The actual decontamination and choice of validation methods was based upon many factors, including complexity of the objects, size, material type, porosity and condition, and the presence of hazards other than asbestos. Decontamination methods included wet washing, compressed air application, and careful HEPA-filtered vacuum cleaning. Methods of testing included visual inspection, passive air sampling and aggressive air sampling.

Ms. Deucher also reported on the basic practices of the asbestos abatement industry, provided some definitions of asbestos abatement terms, described the planning and implementation stages of the project, and some lessons learned.

How Clean is "Safe"?

I addressed the issues of how one evaluates a decontamination procedure or project from an industrial hygiene standpoint. I began by stating that it is unlikely that even the best effort at decontamination will render cultural property "free" of all contaminants. Responsible parties associated with the cultural property will likely want to know the degree of residual contamination. This will result in the need for verification of cleaning procedures/techniques in order to adequately ensure protection of the collections, the environment, and those who might come in contact with either of the two.

There are many methods available for testing the levels of contamination on or associated with cultural property. The methods include visual inspection of a material, collecting physical "bulk" samples of a material, collecting wipe samples from the surfaces of materials, collecting air samples of dust or chemicals in close proximity of a material, or combinations of these methods. The sampling methods for the initial evaluation and an evaluation following a decontamination effort are essentially the same.

Sampling to determine both the degree of contamination and the effectiveness of a decontamination effort is neither a well-regulated activity nor an exact science. There are few directly applicable regulations or guidelines for cultural property. Regulatory guidelines have been developed for other purposes—such as acceptable levels for lead dust contamination published by the Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD)—but these levels are designed to protect occupants of residential environments and may not be directly applicable to the degree of contamination on a museum artifact. An important part of the process of deciding how to verify a decontamination effort is a judgment about the appropriateness of using levels designed for other purposes or choice of an alternative goal.

Deciding what level of contamination is acceptable is complicated and must factor in such considerations as intended purpose, likely audience, and which types of treatment methods are acceptable. For example, an item that will be permanently sealed in a plastic case can be treated differently than an item that will be handled routinely and extensively by children. Following an assessment of the purpose and audience, those responsible should consider what types of risks to those handling the material are acceptable. Organizational managers, risk managers, lawyers, medical staff, and health and safety personnel may need to play a role in the decision of acceptable risk.

In the Building 17 project, the clearance criteria and the test methods were based on clearance levels established by the EPA for asbestos abatement. The testing goals were well defined and established prior to the beginning of the project. The clearance testing required aggressive air clearance sampling for many objects. This type of sampling was done using leaf blowers and oscillating fans in an attempt to stir up residual asbestos in the testing chamber following decontamination. The project designers felt that this levesl of disturbance would exceed any disturbance caused by conservators or museum staff during normal handling of the collections. Thus, this method was defendable because the testing was likely to create worse conditions than routine exposure and objectives, as it was based on EPA defined values.

Goals for decontamination and the target levels of residual contamination should be considered following the assessment of the purpose, audience, and acceptable risk. Using scientific testing equipment and methods developed for other purposes, a well-intentioned and effective sampling strategy can be devised for evaluating levels of contamination on cultural property. The goals should be well defined, objective, defendable. and have some basis in the scientific method.

The workshop concluded with a question-and-answer session and several demonstrations. The practical aspects of containment, personal protective equipment, and the filter system for a HEPA-filtered vacuum cleaner were discussed.

Though some conservators may never encounter some of the specific hazards discussed in the workshop, it is likely that many conservators will encounter cultural property that has been contaminated by some form of environmental hazard. In these instances, it is best to be informed of safe and available choices and options. With this information at hand, conservators will be able to strike the balance between protecting their own health and safety while conserving cultural property.

—Dennis Ertel, Sandler Occupational Medicine Associates, Inc. (SOMA), 966 Hungerford Dr., Rockville, MD 20850; (301) 217–0092; dennysoma@yahoo.com