

THE CONSERVE-O-GRAM

by Diana R. Pardue

The National Park Service's Division of Museum Services provides field areas of the National Park Service with assistance in managing the park museum collections. These professional services include formal training for employees, curatorial management programs, conservation and treatment of artifacts, curatorial supplies and equipment, and a museum clearinghouse.

One of the curatorial management programs is the "Conserve-O-Gram." The COG makes curatorial and conservation information available to all NPS areas and some private museums. Each COG covers one topic of curatorial management, such as light damage or relative humidity, and offers guidelines and solutions that can be applied by a museum staff member. Some examples of COG's are included as well as a listing of the ones which are currently available.

As new information on conservation and collection management comes to light, the old COG's are revised and new ones created. They are designed to fit in a three-ring notebook and numbered uniformly for easy reference.

COG's are distributed through the Regional Curators in each of the Regional Offices. They maintain a mailing list of private museums who wish to receive complete sets and updated copies. A listing of the Regional Curators and their addresses is included here.

*Ms. Pardue is a Staff Curator in the Division of Museum Services, Harpers Ferry Center, Harpers Ferry, West Virginia, National Park Service.

A List of Currently Available Conserve-0-Grams

1 - Collection Management

- 1/1 Management Policies - Historic Objects
- 1/2 Professional Support for Care of Historic Objects
- 1/3 The Conservator
- 1/4 Curatorial Conservation Bibliography
- 1/5 Determining Value of Museum Objects
- 1/6 Inventorying a Large New Accession
- 1/7 Purchases of Objects for Museum Collections
- 1/8 Preservation of Collections
- 1/9 Inventorying Your Collection

2 - Security, Fire, and Safety

- 2/1 Safety Considerations in Halon 1301 vs. CO₂ Fire System
- 2/2 Safety in Conservation
- 2/3 Flameproofing Hay

3 - Agents of Deterioration

- 3/1 Causes of Damage to Museum Objects
- 3/2 Simple Test for SO₂ in the Air
- 3/3 Light Damage
- 3/4 Light Filtering Screens
- 3/5 A Method of Measuring Light Levels in Exhibit Areas
- 3/6 Prevention of Mildew: General Guidelines
- 3/7 Relative Humidity

4 - General Storage Conditions

- 4/1 Study Collection - Storage in National Parks

5 - Ethnology

- 5/1 Problems of Baskets
- 5/2 Cleaning Baskets
- 5/3 First Aid Mending of Baskets
- 5/4 Storing Baskets in Polyethylene Bags
- 5/5 Celluloid

6 - Excavated Museum Specimens

Currently Available Conserve-O-Grams, (Cont.)

7 - Furniture and Wood

- 7/1 Some Do's and Don'ts on the Care of Museum Furniture
- 7/2 Cleaning Furniture Finishes
- 7/3 Waxing Furniture
- 7/4 Butchers Wax on Wood Floors
- 7/5 Wood Preservation - Farm Implements
- 7/6 Enemies of Upholstered Furniture

8 - Glass and Ceramics

- 8/1 Ceramics and Glass, Preventative Conservation

9 - Leather

10 - Metals

- 10/1 Conservation Treatment of Iron Objects by Mechanical Means
- 10/2 The Last Saga?

11 - Natural History

- 11/1 Maintaining Biological Specimens Preserved in Liquid
- 11/2 Specific Gravity Meters
- 11/3 Bibliography for Managing Biological Collections
- 11/4 Suggested Shipping Procedure for Mammal and Amphibian Specimens

12 - Paintings

- 12/1 Dusting Paintings
- 12/2 Removal of Foreign Matter from between Canvas and Stretcher of Paintings
- 12/3 Painting Racks

13 - Paper

- 13/1 Proper Framing of Museum Prints
- 13/2 History of Paper Quality
- 13/3 Determining the pH of Paper
- 13/4 How to Flatten Folded or Rolled Paper Documents

14 - Photographs

- 14/1 Archival Photographs
- 14/2 Archival Photographs - Storage Cabinets and Storage Areas
- 14/3 Arranging Your Photographic Files

Currently Available Conserve-O-Grams, (Cont.)

15 - Stone

16 - Textiles

- 16/1 Examining Textiles in Museum Collections
- 16/2 Cleaning of Textiles
- 16/3 Padded Dummy for Storage of Garments
- 16/4 Rolling Textiles for Storage
- 16/5 Control of Mildew on Textiles

17 - Shipping and Packing

- 17/1 Shipping Specimens to Harpers Ferry Center
- 17/2 Packing Specimens for Shipment
- 17/3 Double Crating Artifacts for Shipment

18 - Supplies, General Curatorial

- 18/1 Request for Museum Curatorial Supplies

19 - Training and Museum Associations

- 19/1 Conservation, Museum and Historic Organizations and Publications

20 - Museum Records

- 20/1 Accessioning Procedures - "A Practical Summary"
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PROFESSIONAL SUPPORT FOR THE CARE OF HISTORIC OBJECTS

Many National Parks have museum collections although historic objects are not the parks' primary area of emphasis. Nonetheless, the park staff has the responsibility to care for this collection. Management requirements for satisfactory care of museum collections are outlined in Management Policies 1975. See Conserve-O-Gram "Management Policies - Historic Objects" (1/1). Professional assistance in carrying out these policy requirements is available through the following:

Regional Curator - Some regions have a curator in the Regional Office to assist the parks with curatorial problems. In regions without a Regional Curator, the Chief of Interpretation is your best contact.

Division of Museum Services - This Division, located at Harpers Ferry Center, employs a number of museum conservators. Each conservator specializes in areas of object care such as paintings, paper, metals, furniture, ethnology, textiles, and archeological conservation. This staff is available to answer questions on collection management as well as object care. This Division also provides direct park support in the form of curatorial supplies from storage cabinets to acid-free folders. The Division Contract Conservation Specialist can assist you in locating reliable contract conservators and writing specifications for managing contract work. For further information contact your Regional Curator or the Division of Museum Services, Harpers Ferry Center, 304/535-6371, ext. 352 or FTS 925-6352.

Division of Reference Services - This Division, also at Harpers Ferry Center, has servicewide responsibility for furnishing planning for historic structures. They operate a servicewide clearing house of historic artifacts, assist parks in obtaining artifact reproductions, and provide expertise on artifact inquiries. For further information contact the Division of Reference Services, 304/535-6371, ext. 261 or FTS 925-6261.

Physical Security Coordinator - Each region has a Physical Security Coordinator to assist in establishing adequate protection for your collection. Call your Regional Office for further information.

Archeological Centers - The Park Service maintains archeological centers to assist in handling archeological specimens that are not part of the museum collection. For further information contact the Midwest Archeological Center, Lincoln, Nebraska, 402/471-5392; Southeast Archeological Center, Tallahassee, Florida, 904/222-1167; or Western Archeological Center, Tucson, Arizona, 602/762-6501.

Curatorial Methods - Phase I & II - These courses offered through the Mather Training Center provide basic training in museum management. Contact your Training Officer or your Regional Curator.

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Conserve-O-Grams - These publications are one-page leaflets on various aspects of curatorial management published by the Division of Museum Services. They are distributed through the Regional Offices.

Museum Handbook - The Handbook is one of the few remaining field guides in current use. Most aspects of museum operations are included. Contact the Division of Museum Services for copies.

A general guideline for working with museum collections is -- if unsure, don't do anything; get professional assistance.

Fonda Ghiardi Thomsen

SPECIFIC GRAVITY METERS

Specific gravity meters may be calibrated to any of several scales. For checking concentrations of preservatives used for biological specimens, the most versatile scale is probably the specific gravity scale, which may be used for a variety of liquids at various temperatures. It is available in a short length of 6-6 1/2 inches; a convenient size for measuring small quantities. Harpers Ferry Center will be stocking one which measures specific gravities from 0.700 to 1.000, which is adequate for determining concentrations of both ethyl and isopropyl alcohol. Other specially calibrated "alcoholometers", are available from suppliers. A short form is available which measures % proof of ethyl alcohol, and a long form (11-15 inches) is available which measures % by volume (Tralle) of ethyl alcohol. These are not as versatile as the specific gravity meter mentioned above.

Concentrations of Preservatives for Biological Specimens

<u>Ethyl Alcohol</u> <u>(% by Volume)</u>	<u>Specific Gravity</u> <u>15-20°C (59-68°F)</u>	<u>Type of Specimen</u>
60	0.895 - 0.891	Sometimes used for amphibians.
65	0.884 - 0.879	Used for most amphibians; geckos
70	0.872 - 0.868	Birds, mammals, reptiles, fish, amphibians, crustaceans, cephalopods, polychaete worms, insects, flatworms, roundworms, mollusks, echinoderms, some arachnids
75	0.860 - 0.856	Arachnids, centipedes, millipedes, coelenterates, reptiles.
80	0.848 - 0.843	Land slugs
85	0.835 - 0.831	Leeches
90	0.822 - 0.818	

<u>Isopropyl Alcohol</u> <u>(% by Volume)</u>		
70	0.863 - 0.858)	
60	0.887 - 0.883)	Sometimes used for invertebrates; preferred by some for polychaete worms
50	0.910 - 0.907)	
40	0.910 - 0.931)	
		Vertebrates

Formalin 7-10% by Volume Must be used for earthworms; amphibian eggs and larvae; sometimes for coelenterates, reptiles & amphibians

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CAUSES OF DAMAGE TO MUSEUM OBJECTS

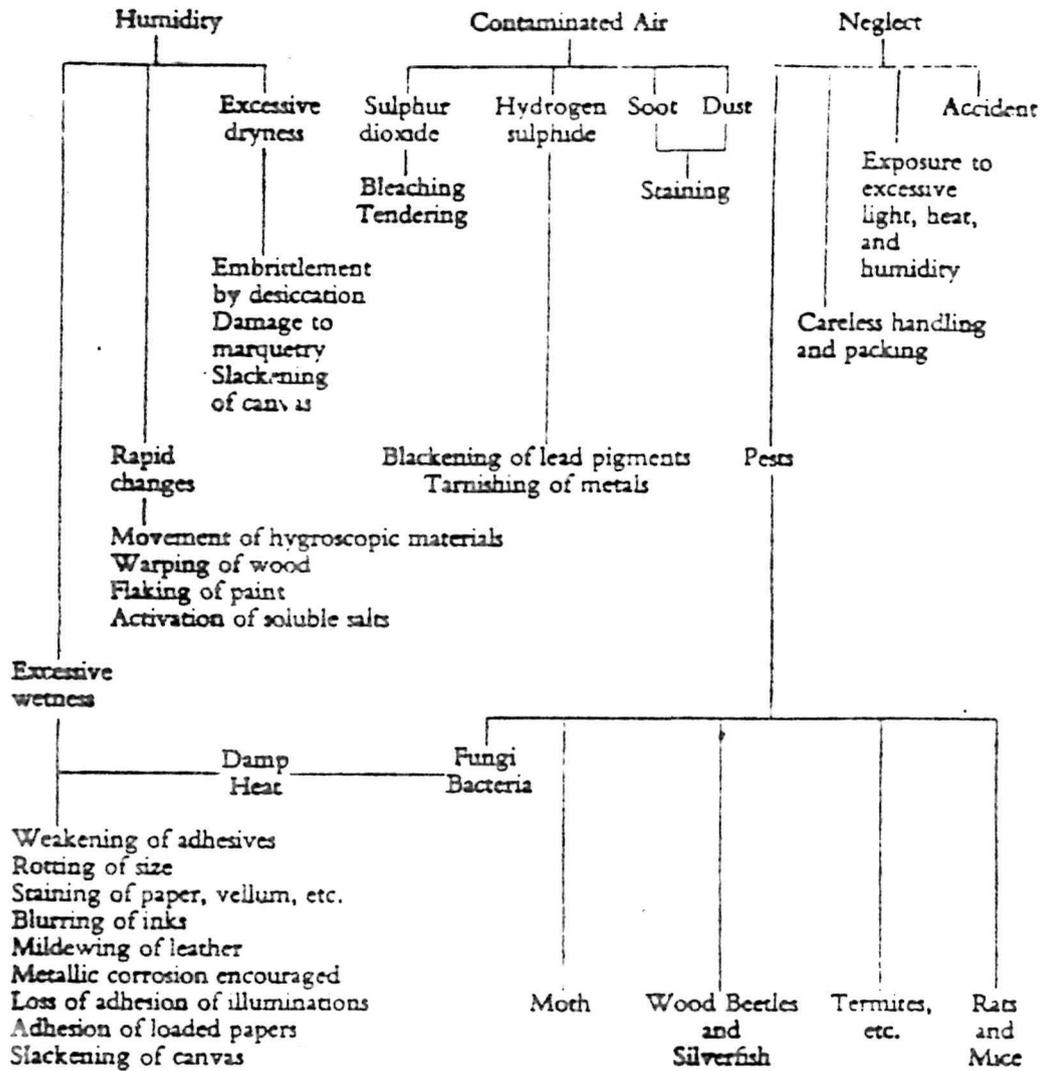


FIG. 3

07/75

Taken from The Conservation of Antiquities and Works of Art, by Harold J. Plenderlith and A.E.A. Werner, Oxford University Press, 1976, page 18.

REV. 9/79

The use of pesticides in NPS museum collections has been a commonplace procedure for decades. However, recent information indicates that many of the chemicals that have been routinely used for this purpose are dangerous and may be undesirable. In view of these changes, the Division of Conservation, Harpers Ferry Center, has investigated available data on paradichlorobenzene (PDB) (chemical formula $C_6H_4Cl_2$) to re-examine its usefulness for pest control in our collections.

Preliminary investigations indicate many serious concerns regarding the continued use of PDB. Any new NPS policy on the use of PDB must await further evidence from toxicological and museum-related studies. It is important that park staffs be aware of this pesticide's potential problems and stay abreast of the latest available information on the health hazards it presents. Forgo usage when insect or mildew infestation is not a threat, or when there is an alternative, safer method of control (i.e., climate control or regular inspection), (see Conserve O Gram 3/12).

Much of the following information on PDB has been excerpted from the book, Pest Control in Museums (Edwards, Stephen R., et al, Association of Systematics Collections, Lawrence, Kansas, 1981), one of the best published sources of information on museum fumigants, and Dangerous Properties of Industrial Materials (Sax, Irving, Van Nostrand Reinhold, New York, 1979).

HEALTH RELATED EFFECTS:

ROUTE OF ENTRY: Skin contact, inhalation, ingestion.

ORGANS AFFECTED: Liver, kidneys, respiratory system, skin and eyes, central nervous system.

ACUTE EFFECTS (short-term): Narcosis (dizziness, drowsiness, headaches, nausea, loss of coordination); skin, eye, and respiratory system irritation.

CHRONIC EFFECTS (long-term): Dermatitis, liver and kidney damage, loss of appetite, nausea, vomiting, jaundice and liver cirrhosis.

CARCINOGENIC EFFECTS: Suspect

REPRODUCTIVE EFFECTS: Unknown

THRESHOLD LIMIT VALUES (permissible safe concentrations in the air in work areas as established by federal regulation; TLV):

Time Weighted Average (normal 8-hour day or 40 hour workweek, repeated exposure without adverse effect) = 75 parts per million (ppm)
[450 mg/m³]

Short Term Exposure Limit (maximal safe concentration for 15 minutes of continuous exposure without adverse or irreversible effects) = 110 parts per million (ppm) [675 mg/m³]

NOTE: ICCROM recommends that exposures remain below 50% of the regulatory levels.



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EFFECTIVENESS:

AS CONTACT PESTICIDE: No

FOR PREVENTATIVE MAINTENANCE: Yes, as a vapor phase repellent in tightly sealed storage and exhibit cases.

AS FUMIGANT: Reportedly successful in high concentrations in tightly sealed storage cases. Because of health hazards, not recommended by National Park Service.

RECOMMENDED DOSAGE:

9.0 lbs. per 1000 cubic feet is commonly used and considered an effective repellent level (2.7 ounces per standard specimen cabinet). Efficacy tests are urgently needed to determine minimum required levels.

REMARKS:

- 1) This pesticide is currently under review by Environmental Protection Agency for registration for institutional use.
- 2) Use in closed storage unit, DO NOT USE IN OPEN SPACES.
- 3) Do not allow PDB to come into direct contact with the specimens.
- 4) Use neoprene or polyvinyl alcohol gloves and a full-face respirator with black organic vapor canister when handling PDB.
- 5) PDB is effective in repelling microorganism attack, e.g. mildew.
- 6) PDB vapor is flammable; when vapor is exposed to open flame it produces corrosive gases.

The basic problem is that all pesticides are toxic to some extent towards animals and humans. Human safety often depends on the procedures followed for application as well as the level, or quantity, of the chemical applied. Accordingly, the use of PDB in NPS museums has been too lax. PDB should never be used in open storage or exhibit situations. Its effectiveness and safety can be ensured only if cabinets or cases are kept as airtight as possible. Appropriate protective devices such as neoprene and polyvinyl alcohol gloves and full-face respirators with black organic vapor canisters should be worn by persons opening such containers.

Most users of PDB have not understood that the chemical acts as an insect and microorganism repellent at low levels but reportedly acts as a fumigant only at high levels. Considering the various problems associated with its usage, only low level, repellent usage can be recommended. Careful application and regulation of the chemical is critical; standardization of its usage is essential. NPS policy also states that all uses of pesticides in NPS units must have annual approval by the Director. For information and procedures concerning pesticide use contact Regional Integrated Pest Management (IPM) Coordinators or the Servicewide IPM Coordinator. It is imperative that objects be carefully selected for exposure to PDB since many materials can be adversely affected, (see Conserve O Gram 3/13).

Toby Raphael
Ethnographic Conservator
Harpers Ferry Center
10/85

MAINTAINING BIOLOGICAL SPECIMENS PRESERVED IN LIQUID

Storage - For most biological specimens preserved in liquid, 65-90% ethyl alcohol, 40-70% isopropyl alcohol, or 3-10% formalin are the preservatives used. Ethyl alcohol is considered to be best for most purposes. Formalin is used for certain delicate, soft-bodied animals with a high water content (Such as amphibian eggs and larvae), and for field preservation of many other specimens, but its acidic nature causes colors to darken and bones (etc.) to decalcify. If used, it should be buffered with 200 grams of hexamethylenetetramine ("Hexamine") per liter of commercial strength formalin. Most specimens are stored in pint to gallon-sized wide mouthed bottles (larger sizes lose relatively less liquid), with tightly sealing lids. Very small specimens are stored in vials filled with preservative and stoppered tightly with cellucotton or with polyethylene caps, which are inverted inside a larger jar which is also filled with preservative. All liquid-preserved specimens are subject to light damage. They should be stored on shelves in a dark place. Federal Supply Service Item 7125-269-8534 (Storage Cabinet, 6 adjustable shelves, set-up) is ideal.

Maintenance - Every six months, check the level of preservative and fill jars completely. Don't mix preservatives. Each jar should contain a label marked with the type and concentration (preferably by % volume and specific gravity) of the preservative used. Remember that alcohol evaporates faster than water, so eventually it will become too weak to preserve the specimen. The concentration of alcohol should be checked periodically with a specific gravity meter or alcoholmeter, especially if the level of liquid has dropped very low. Cloudy liquid indicates that most of the preservative has evaporated, or that the specimen was not properly fixed so that formalin penetrated the body cavity. In either case, the specimen has begun to macerate. Replace the preservative immediately, or fix the specimen properly with formalin and wash in water and preserve in alcohol as if it were a fresh specimen. Formalin tends to evaporate slowly, but its corrosive action on metal lids may eventually cause faster evaporation. Weak formalin may have a layer of mold growing on the surface. Skim it off and replace the liquid with formalin of the proper strength. Replace corroded or cracked jars and lids; these allow preservative to evaporate more rapidly. Two products which seem to be effective in reducing the evaporation rate are: (1) Marathon "Parafilm" (available from many suppliers) which is placed between the jar and lid; and (2) Uniroyal Industrial Adhesive, Serial No. 6273 (US Rubber Co., Mishawaka, Indiana) in which the top of the sealed jar is dipped.

Be careful of specimen tags. Never remove them. Occasionally a specimen tag will have been made of flimsy, low-quality paper which is easily torn when wet or which will disintegrate after a short time. To preserve the association of specimens having such tags, with the data on their catalog cards and elsewhere, make a new tag on 100% rag label stock (such as Resistall Index) which will not be likely to disintegrate or tear when wet. Copy the catalog number from the old tag without touching it or removing it from preservative, which may cause its destruction before it

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can be copied; copy any other data present exactly as it appears on the tag, and double-check for errors. Use Higgins Eternal Ink, and allow it to dry thoroughly before submersing it. Tie the new tag to the specimen in the proper place.

Specimens whose preservative has dried up may be mummified (if they are small and the climate is dry), or they may begin to macerate. Seek professional help.

Lynn Carroll

6/76

H1817(408)

FEB 17 1994

Memorandum

To: Directorate, Field Directorate, and Park Superintendents
From: Associate Director, Cultural Resources
Subject: Issuance of the Revised *Conserve O Gram* Series

The recently revised NPS *Conserve O Gram* series are now being distributed servicewide. The *Conserve O Gram* series are being shipped directly from the U.S. Government Printing Office to Regional Curators; the new binders are being shipped by the Curatorial Services Division Harpers Ferry Office. The Regional Curators are coordinating the distribution of the series and binders to parks and centers.

This series of collections management technical leaflets supplements the NPS *Museum Handbook, Part I* (Rev 9/90). Topics addressed include museum collections preservation and protection procedures; curatorial health and safety issues; identification of agents of deterioration and evaluation of object condition; procedures and techniques for storage and exhibition of museum objects; and sources of assistance including bibliographies.

The new series contains 56 leaflets and represents the culmination of several years work by the NPS *Conserve O Gram* Committee, numerous authors, both inside and outside the National Park Service, and the Curatorial Services Division, WASO. In addition, the series departs from the old look with new colors, a new masthead, column format, and a new binder.

The new series has also been renumbered, therefore leaflets retained from the old series may be in a different order or, in some cases, in a different section. The new series supersedes all *Conserve O Gram* leaflets issued from 1975 to 1990. Some leaflets from the old series were not revised because the content was obsolete or it had been incorporated into a more permanent document such as the NPS *Museum Handbook, Part I* (Rev 9/90). The Curatorial Services Division will issue supplements semi-annually covering new topics and updating guidance as practices and technology evolve.

Because many existing NPS documents refer to the *Conserve O Gram* series by the old numbers, parks should retain the old series in their libraries for reference purposes. The title page should be marked "Obsolete: superseded by revised series dated 1993. Retain for reference."

The revised *Conserve O Gram* series will be available for purchase by non-NPS users. The Superintendent of Public Documents, U.S. Government Printing Office has agreed to sell the series as a three-year subscription.

Comments on the new series and suggested topics for future supplements are welcomed by the Curatorial Services Division, Harpers Ferry, WV 25425.

/s/ Jerry L. Rogers