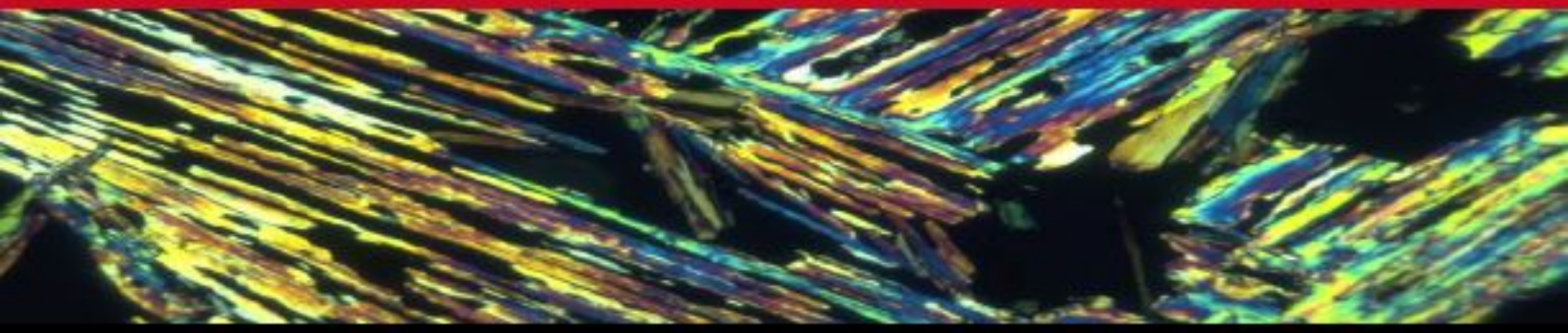
Materials Research Series



Conservation and Art Materials Dictionary

2000-07

MUSEUM OF FINE ARTS, BOSTON

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US Department of the Interior
National Park Service
National Center for Preservation
Technology and Training
Publication # 2000-07

Final Report

Conservation Material Database
Grant # MT-2210-8-NC-12

May 16, 2000

Sponsor: Museum of Fine Arts, Boston
Principal investigator: Michele Derrick

Conservation Materials Database
— Final Report —
NCPTT 1998 Grant# MT-2210-8-NC-12

Executive Summary

This grant funded the expansion and review of a database with an initial working title of Conservation Materials Database. It is now called Conservation and Art Materials Dictionary (CAMD). The database incorporates technical information about historic and contemporary materials used in all aspects of the conservation, preservation and production of artistic, architectural and archaeological materials. No other resource in the field of conservation has attempted to provide reference data of this scope and magnitude. Thus the database is an important step in the development and defmition of the growing fields of conservation and historic preservation.

During the past year the primary investigator, Michele Derrick, has researched, compiled and entered information on over 9900 materials. Six contributors/reviewers (Gordon Hanlon, Pam Hatchfield, Teri Hensick, Meredith Montague, Ivan Myjer, Roy Perkinson) from varying fields of expertise (furniture, objects, paintings, textiles, architecture and paper) provided numerous texts, journals, articles, brochures and catalogues for data entry. This included information on pigments, minerals, binders, coatings, adhesives, fibers, dyes, solvents, reagents, corrosion inhibitors, surfactants, pollutants, pest control agents and others. Materials were cross-referenced by CAS names, common names, archaic names and brand names. Each record contains a general description, chemical composition, physical properties, stability, and safety precautions, along with conservation uses and historical information. The information was gathered from extant resource books and synthesized into a concise dictionary format with the addition of literature citations leading to other sources for in-depth descriptions and/or conservation usage.

Each of the six reviewers used an early prototype database. They reviewed the format and content as well as examined many of the entries. Their written comments are attached to the final report. In addition to many specific changes there were three dominant recommendations from the reviewers.

1. It is important that a wider audience of experienced conservators review and edit the entries.
2. The citations for further information is a key field and it is very important to have this field as complete as possible.
3. The searching mechanisms for the data need to be revised to include more options.

The recommendations of the reviewers have been incorporated into the structure of the database.

The database is currently on-line through the Intranet at the Museum of Fine Arts, Boston. It is being used and reviewed by more than 200 specialists (curators, conservators, collection care specialists, registrars, students, etc.) throughout the Museum. In June 2000, CAMD will be introduced at the annual meeting for the American Institute of Conservation in Philadelphia. It will then make its debut on the Internet July 1, 2000. For the initial six months on the Internet, access will be limited by password to volunteers who agree to provide additional commentary and review. The

database format allows searching, browsing and comparison of all records. Internet distribution ensures a wide audience will have access to the database. Because of the digitized format, it will continually be added to and revised, as additional information becomes available.

The Conservation Materials Database is an important resource of information for the fields of conservation and preservation. As a depository of information, it will become a historical record of the use of conservation and art materials.

Project Narrative

Introduction

As with any growing field of expertise, art conservation and historic preservation has its own unique collection of terms, materials and techniques. These conservation terms must be defined and disseminated to provide the developmental cornerstone needed for a solid professional base. Currently, however, the conservation field is lacking in this area.

In the past fifty years, some excellent books, by Rutherford Gettens, George Stout, Ralph Mayer, Reed Kay, Max Doemer, C.V. Horie, E.J. Lebarre and others have been important resources in the field of art conservation. While these books supply technical information on materials and processes used in art and conservation, they are limited by their focus on specific areas as well as by their lack of information on contemporary materials used in conservation and preservation treatments, such as adsorbents, corrosion inhibitors, geotextiles, enzymes, surfactants, and some polymers. A more recent attempt to produce an on-line database (Materials Conservation Information Network, MCIN) with technical information on materials has been criticized for lacking a useful number and variety of materials.

Outside the field of conservation, there is no incentive to combine the interdisciplinary set of information that encompasses artistic and historic materials. Instead each specialized industry developed handbooks to meet their specific requirements, such as *Standard Handbook of Textiles*, *Metals Handbook*, *Dictionary and Encyclopaedia of Paper and Papermaking*, *Merck Index*, and *Polymer Handbook*. Thus, while these resources are available, it can be expensive, time-consuming and frustrating for a conservator or conservation scientist to search multiple sources for desired data. It is important for conservation to develop reference collections to meets its own needs.

Conservation and preservation of historic materials is a broad yet complex field and the levels of training and experience can vary greatly. Since the building blocks of the field are the materials and methods it encompasses, the Conservation Materials Database (now called the Conservation and Art Materials Dictionary, CAMD) aids in the standardization of terminology, increases access to obscure information as well as provides a guide and references for additional information. The dictionary also creates a historical context for materials used in conservation in the last few decades and develops a chronological record of new materials as they are evaluated for used. Thus the dictionary is an

important resource of information for the fields of conservation and preservation.

Database introduction

The Conservation and Art Materials Dictionary (CAMD) is a digitized dictionary that includes descriptions and technical information about historic and contemporary materials used in the production and conservation treatment of artistic and historic works. CAMD brings together the wide range of materials (pigments, minerals, binders, coatings, adhesives, fibers, dyes, solvents, reagents, woods, surfactants, corrosion inhibitors, pollutants, pest control agents, construction and storage materials, etc.) used by different specializations. It also includes methods and terms used in the analysis and characterization of these materials. While initially conceived as a vehicle for art conservators and conservation scientists, this comprehensive set of information on materials will also be useful to students and professionals in other fields such as art history, architecture, art, design, archaeology and education.

All facts provided in the dictionary are obtained from published sources such as books, articles, manufacturer's literature, material safety data sheets and web pages. Each entry was selected based on its mention in art, conservation or related scientific literature or its presence in one of several conservation labs. However, the inclusion of a material in the dictionary is not a recommendation for its use in conservation or art and does not mean that the material is or has been used successfully. In fact, some historic materials have been used in treatments or objects with adverse results, such as soluble nylon. Additionally, many of the materials listed are dangerous, deleterious and/or highly toxic, such as the 19th century arsenic insecticides.

Like any dictionary, this information is intended as a short definition of the material and its potential uses. References are included to direct the reader to more specific information about a material and its applications. Prior to any use, it is important to read the MSDS sheets and the further information citations.

Since the field of conservation is constantly growing, new materials and techniques are evaluated continually resulting in many additional information and reference sources. Thus, the dictionary is continuing to expand and be updated, as data become available.

Field Definitions

Material Name - This is the prime field for the record in that all other fields serve to define and describe the name field. For a material, the key name entry is the most commonly used (and chemically correct) terminology. For example, isopropyl alcohol is a main entry while isopropanol and 2-propanol are synonyms.

The following types of materials and related terms are included in the database:

1. materials used in the production, conservation or analysis of historic and artistic objects and sites, including pure materials (cotton, gold, English oak, peroxide, etc.) as well as processed materials (Tyvek®, Dutch metal, eosin, portland cement, Art-Sorb®, etc.)

2. compositional groups (acrylic, oil, alcohol, polymer etc.)
3. chemical and physical phenomena (relative humidity, crystallization, absorption, etc.)
4. functional classes (abrasive, detergent, scavenger, geotextile, etc.)
5. analytical tools (hygrometer, Macbeth booth, infrared spectroscopy, etc.)
6. material characterization (crizzling, hardness, tear resistance, etc.)
7. selected devices (solander box, smoke detector, air filter, etc.)

Trademarks: Care has been taken to use the correct spelling and punctuation with each of the Trademark and brand name items.

Synonym - Alternative, trivial and archaic names are listed as synonyms. Commonly used synonym names are listed separately and cross-referenced to the key name. Many common misspellings, particularly of brand name materials have also been added since this can otherwise result in failed searches. For example, microballoon now appears in the synonym lists for both microsphere and Micro-Balloon®. Because of the new joint search macro, any name or spelling listed in either the material name field or the synonym field will be included in the search results list.

Description - This field provides a brief description of the material. These entries are not encyclopedic but rather provide a brief but comprehensive technical definition. The general format used for an entry is to first identify the general class of material (fiber, polymer, pesticide, etc.) then identify its primary use or biological source. For a natural product, its native geographical region is listed. Information is supplied about the materials production, manufacturer, historical availability, composition and physical characteristics (appearance, physical state, melting point, volatility, odor, density, crystallinity, refractive index, solubility, strength and hardness, etc.). The entry is followed with a listing of the industrial uses of the material, such as self-stick adhesives, fabric coatings, printing inks, etc. Additionally, specific examples of the material's conservation uses are listed with accompanying citations. Because of the condensed format for these descriptions, references, such as for review articles, book chapters and books, are included to direct the reader to more specific information about a material and its applications. Eventually, some of the references, such as manufacturer's web pages and cited JAIC articles will have direct hyperlinks to other web sites on the Internet.

Properties - Some important chemical and physical properties for the materials have been extracted from the text and entered in a tabular form for easier reference and comparison. These are:

1. Composition - the chemical formula is supplied for pure chemical compounds.
2. Chemical Abstract Service Registry Number (CAS) - This universally used number is included for specific compound identification regardless of its name or synonyms. CAS numbers also aid in the retrieval of information from some computerized databases such as Hazardous Materials Database.
3. Melting point, Boiling point, and density - The Merck Index has served as the primary standard for these values with the Condensed Chemical Dictionary as the secondary reference. For solid materials, it has been assumed that specific gravity values are equivalent to density and have, in some cases, been entered as such. All

densities have the units of g/cc (grams per cubic centimeter) for solids and g/L (grams per liter) for liquids unless otherwise stated.

4. Additional information, such as Mohs hardness, refractive index, moisture regain, tenacity and elongation, is also entered when available.
5. Solubility - separated into Soluble, Slightly soluble and Insoluble for most cases. However, some materials have lists of chemicals that are unreactive or reactive.

Hazards - Information on safety factors is included such as flammability, explosion risk, carcinogenicity and toxicity. However, this can not be considered an authoritative source on all hazards. The MSDS sheet should be read prior to the use of any product.

Further information - Because of the condensed format for these descriptions, references are cited for literature sources that provide more extensive information. The citations are limited to one or two references that provide current information about the material, its application and characteristics of use.

Units - A pull-up table has been incorporated to provide the full text for all abbreviations and units. It is readily accessible from any entry page in the database.

Project Review and Management

The project of the Conservation and Art Materials Dictionary (CAMD) has been developed and managed at the Museum of Fine Arts (MFA), Boston. The overall scope, direction and content have been supervised and reviewed by:

- *Arthur Beale, Chair of Conservation and Collections Management Department, MFA*
- *Richard Newman, Head of Scientific Research, MFA*

Additionally, six contributor/reviewer members of the project team were. selected for their extensive experience and breadth of knowledge in their respective fields. They are:

- *Gordon Hanlon, Head of Furniture and Frame Conservation, MFA*
- *Pamela Hatchfield, Head of Objects Conservation, MFA*
- *Teri Hensick, Conservator of Paintings, Straus Conservation Center, Harvard Art Museums*
- *Meredith Montague, Head of Textile Conservation, MFA*
- *Ivan Myjer, Conservator, Building and Monument Conservation*
- *Roy Perkinson, Head of Paper Conservation, MFA*

All the reviewers collected and submitted information for inclusion in the database. This will continue as an ongoing process of the Conservation Department at the Museum of Fine Arts, Boston. The database will grow and be updated as additional resources are, located.

A draft of the digitized database and selected hard copy entries were sent to six project team reviewers in September 1999. They reviewed the format and content of the database as well as examined selected entries. Their recommended revisions to entries have been made directly to the database. The overall written reviews are attached to this final report.

The reviews provided many good suggestions that have been changed, such as:

1. The page format has been modified such that the database will not override the Windows operating function and will permit the user to switch back and forth between the dictionary and other programs on the computer.
2. The size of the field boxes has been decreased to allow all the text to be seen at one time. Thus it will not be necessary to scroll back and forth to see the complete text.
3. New reference sources have been included to fill in some incomplete areas of information.

In addition, there were three dominant recommendations from the reviewers that have been implemented. These are:

1. *It is important for a wider audience of experienced conservators to review and edit the entries.* A two step process was developed to provide for this expanded review process. The first step was to place a prototype version of CAMD on the Intranet system at the MFA. This step allows more than 200 specialists (conservators, curators, collection care specialists, registrars, students, etc.) to use and review the information. The second step of the expanded review process will occur in July 2000, when CAMD will be placed on the Internet with controlled (password) access for a six-month period. The password will be disseminated to volunteers in the conservation and preservation community. This step allows a diverse, but experienced audience to act as reviewers and supply additions and revisions. At the end of this time, the dictionary will have unlimited access on the Internet. It will, even at this point, retain a submission page for comments, revisions and updates. Additionally an authority field has been incorporated in the nonviewable portion of each record to track the reviewers' names, comments and changes for each material.
2. *The citations for further information is a key field and it is very important to have this field as complete as possible.* Additions have been and will continue to be made to this field.
3. *The searching mechanisms for the data need to be revised to include more options.* As part of the development of CAMD on the Intranet at MFA, the database has been converted from a Filemaker Pro system to a Microsoft Access system. This has included a major structural change in the viewing and searching of the data. The search page has been revised to include all viewable fields. Additionally a macro has been written to automatically link the synonym field to the material name field. Additionally, since the computer searches will find only exact matches for a given request, alternate spellings and misspellings of materials are being added to the synonym field (i.e., Bioplastic for the trade name of BioPlastic).

The reviewers have mentioned numerous other good recommendations. Each of the recommendations were considered and incorporated into the structure of the database.

Database Dissemination

The CAMD has the potential to be a major source of information for the conservation community as well as for other related fields, such as art, art history, architecture, design, education and archaeology. However, for the database to be useful it must be disseminated. There are several options for the dissemination of the database. One

potential route is for the publication of the database in a dictionary format. One publisher, Butterworth-Heinemann, was initially approached with the concept of the database and has been kept apprised of its development. They are interested in considering its publication and this possibility will be further explored. The second option for dissemination is to release the dictionary in a CD-ROM version. This option is currently on hold since the conversion to Microsoft Access format no longer allows runtime version of the software to be made.

The final option for the dissemination of the dictionary is publication on the Internet. The World Wide Web is becoming ever important as an alternative publication source since it provides an immediate, diverse and international audience. The database format of the information can be readily searched and browsed to obtain full impact of its usefulness. One strength of Internet distribution is that the data can be updated and revised with additional information and materials. This final option was selected and is being implemented.

Currently the CAMD is an ongoing project of the Department of Conservation and Collections Management at the Museum of Fine Arts (MFA), Boston. Michele Derrick has been hired as a consultant to continue to work on the dictionary. As part of the MFA Conservation Department, a prototype of CAMD has been placed on the MFA Intranet (internal) website. The MFA Intranet site provides an avenue for use and review of the database by specialists at the Museum. This includes conservators (seven departments), collection care specialists, registrars, archaeologists, art historians and curators (10 departments).

In July 2000, the database will be placed on the MFA Internet website. For the initial six-month period, its access will be controlled by a password. The password will be distributed to volunteers in the conservation and preservation community that agree to act as reviewers. This final review process will provide the wide scope of expertise that is required to cover the complex and diverse information in the dictionary. Both the Intranet and Internet versions of the database will provide an easy method for submitting changes, additions and queries, so that recommendations can be readily incorporated.

In order to announce and inform the conservation field of the Conservation and Art Materials Database, a presentation and demonstration of the database will be made at the annual MC meeting in June 2000 in Philadelphia.

Project Summary

The CAMD is an important resource for the fields of conservation and preservation. It consolidates technical information about historic and contemporary materials used in all aspects of the conservation and production of artistic, architectural and archaeological materials. No other resource in the field of conservation has this scope and magnitude. The database gives the information in a concise dictionary format while allowing the flexibility for search and comparison of materials. Such a reference will help standardized spelling and increase access to obscure information. The dictionary creates a

historical context for materials used in conservation in the last few decades and develop a chronological record of new materials as they are evaluated for use. Since comprehensive distribution of the dictionary is essential to its effectiveness, the Museum of Fine Arts, Boston will incorporate the database on its conservation website on the Internet July 2000. This will ensure easy access to the information to a diverse audience.

Conservation Database

Conservation and Art Materials Dictionary

search
browse
submit
about

intranet

Welcome to the prototype of the Conservation and Art Materials Dictionary

Developed by the MFA Conservation Department, this interactive version of the dictionary is currently in its final developmental stage prior to release on the Internet by July 1, 2000. It has been placed on the MFA Intranet for testing and review by the MFA staff.

For questions, corrections or submissions to the data please notify Michele Derrick at mrderrick@aol.com or use the submit page.

For technical questions or corrections to the dictionary please notify John Klick at jklick@mfa.org

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Conservation and Art Materials Dictionary

This dictionary includes descriptions and technical information about past and current materials used in the construction and/or conservation treatment of artistic and historic works. Also included are methods and terms used in the analysis and characterization of these materials.

Inclusion of a material in this dictionary is not a recommendation for its use.

Material name or synonym:

Search Reset

advanced search

Conservation Database
Conservation and Art Materials Dictionary

About the Conservation and Art Materials Dictionary

Funded by:
National Center for Preservation Technology and Training
Museum of Fine Arts, Boston

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John Klick
Phil Getchell

Conservation
Conservation and Art Materials Dictionary

Browsing the letter H

There are **268** records that start with the letter **H**. Showing page 11 of 27

previous next

henequen
A hard, strong, reddish fiber obtained from the leaves of the Agave fourcroydes that is native to the Yucatan. Henequen has been used for coarse fabr...

henna
A reddish-orange dyestuff that comes from the leaves of a small cypress tree, Lawsonia inermis, that is native to the Middle East, Africa and Asia. H...

hepars
Common name for any reddish-brown compound formed by the fusion of a sulfur compound with an alkaline metal. For example, the product obtained when l...

heptachlor
A light tan waxy solid with a camphor-like odor. Heptachlor was formerly used as an insecticide for termites and fire ants. The use of heptachlor wa...

Hercose C
[Hercules Inc] A cellulose acetate butyrate film. Hercose C is used for coatings....

Herculon
[Aqualon, division of Hercules Inc] A trademark for a polypropylene fiber. Herculon is used in carpets, clothing and home furnishings....

hermus mineral
Common name for antimony trisulfide used prior to the 1800's when chemical compound names were standardized (Schur 1985)....

herring oil
A light orange oil obtained from fish of the herring family, Clupeidae. Herring oil is obtained by boiling then pressing the fish. Herring oil conta...

hessian
An alternate name for burlap used in Great Britain and some former colonies....

Hessian earth
A 20th century brand name for green earth pigment. See green earth....

previous next

Conservation

Conservation and Art Materials Dictionary

search
browse
submit
about

intranet

Advanced Search

Material name or synonym:

fluorescein

Material Description (such as color, uses, composition, etc.) :

Composition: CAS#: Mohs hardness:

Other: Density: Refractive index:

Melting point (C): Boiling point (C):

Analysis (such as solubility, moisture regain, flame test, etc.):

Hazards:

References and citations:

Search Reset

Conservation Online
Conservation and Art Materials Dictionary

Search Results

Your search returned 7 records. Showing page 1 of 1

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dichlorofluorescein
An orange reagent that is used as a fluorescent indicator for the presence of oil and fats. DCF is available as a powder or a premixed solution of 0....

eosin
A red crystalline dye that is prepared from fluorescein. First discovered by Caro in 1871, eosin is primarily used as an acid dye for producing a blo...

fluorescein
A bright, orange to red crystalline powder that reacts with alkalis to form an intense green fluorescence. Fluorescein is used for the detection of s...

fluorescein isothiocyanate
A fluorescent dye used to detect proteins. Fluorescein isothiocyanate (FITC) is used in biochemistry for the detection of pathogens. It has also bee...

fluorescein sodium
An orange-red, hygroscopic powder. Uranine is the sodium salt of fluorescein. It has an intense yellow-green fluorescence under ultraviolet light. ...

merbromin
An iridescent green crystalline compound composed of mercuric acetate dibromide fluorescein. Merbromin forms a red aqueous solution that fluoresces a...

uranine
See fluorescein sodium

BOSTON

Conservation
Conservation and Art Materials Dictionary

Material Full Record

dichlorofluorescein

An orange reagent that is used as a fluorescent indicator for the presence of oil and fats. DCF is available as a powder or a premixed solution of 0.2% in ethanol. The lipid environment can effect the fluorescence color; DCF fluoresces pink in saturated lipids and bright yellow in unsaturated lipids (Wolbers et al., 1990). Acrylics can give a positive result.

Synonyms:

4,5-dichlorofluorescein; D&C Orange no.8 (delisted); DCF; 4,5-dichloro-3,6-fluorandiol

Composition:	CAS#:	Mohs hardness:
C20H10Cl2O5		
Other properties:	**Density:**	**Refractive Index:**

Melting point (C):	Boiling Point (C):

Analysis:

Soluble in ethanol and dilute alkali. Slightly soluble in glycols and glycerol. Insoluble in water, dilute acids, oils, fats and waxes. Maximum absorption wavelength=513 nm; Maximum emission wavelength= 532 nm.

Hazards:

References and additional information:

R. Wolbers, N. Sterman, C. Stavroudis, "Notes for Workshop on New Methods in the Cleaning of Paintings", Getty Conservation Institute, Los Angeles, 1990.

BOSTON

Conservation
Conservation and Art Materials Dictionary

Material Full Record

fluorescein isothiocyanate

A fluorescent dye used to detect proteins. Fluorescein isothiocyanate (FITC) is used in biochemistry for the detection of pathogens. It has also been used to detect proteins in paint cross sections (Wolbers et al 1990). However, one study has shown that FITC can also fluoresce with oil and acrylic media (Messinger 1992). FITC is sometimes incorrectly called fluorescein.

Synonyms:
FITC

Composition:	CAS#:	Mohs hardness:
	3326-32-7	
Other properties:	**Density:**	**Refractive index:**

Melting point (C):	Boiling Point (C):
>360	

Analysis:
Soluble in water, dimethyl formamide, dimethyl sulfoxide. Maximum absorption wavelength = 490 nm. Maximum emission wavelength = 520 nm.

Hazards:
Skin contact causes irritation.

References and additional information:
R. Wolbers, N. Sterman, C. Stavroudis, "Notes for Workshop on New Methods in the Cleaning of Paintings", Getty Conservation Institute, Los Angeles, 1990.
J.Messinger, "Ultraviolet-Fluorescence Microscopy of Paint Cross Sections: Cycloheptaamylose-Dansyl Chloride Complex as a Protein-Selective Stain" JAIC 31:267-74, 1992.

Conservation

Conservation and Art Materials Dictionary

Material Full Record

lead white

Lead white is a pigment composed of basic carbonate of lead. It contains about 70% lead carbonate and 30% lead hydroxide. Lead carbonate occurs in nature as the mineral cerussite, but this has never been commonly used as a pigment; instead lead white is prepared synthetically from metallic lead and vinegar. Lead white was the primary white pigment used in paintings and ceramic glazes from ancient times to the mid 19th century when it was replaced with zinc white. It was commonly used in house paints till the middle of the 20th century. In the United States, it's use in interior paints has been restricted since the 1950's and prohibited since 1978. Lead white has been replaced as primary paint pigment by zinc white and titanium white, it can still be found in some exterior paints and ceramic glazes. Lead white can yellow or blacken in the presence of sulfur. Cremnitz white is a very white, dense type of white lead prepared from litharge and acetic acid. Occasionally the name lead white has also been used for basic lead sulfate and basic lead silicate.

Synonyms:

flake white; Cremnitz white; white lead; London white; silver white; Krems white; hydrocerussite; Dutch white lead; Flemish white; Vienna white; Berlin white; ceruse; slate white; Pigment White 1; basic lead carbonate; Roman white

Composition:	CAS#:	Mohs hardness:
2PbCO3.Pb(OH)2		
Other properties:	**Density:**	**Refractive index:**
	6.86	1.80-2.08

Melting point (C):	Boiling Point (C):

Analysis:

Soluble in acids; Insoluble in water and ethanol. Darkens in the presence of sulfur fumes. Fluoresces reddish purple.

Hazards:

Toxic by inhalation or ingestion. Skin contact may cause irritation or ulcers. Carcinogen, teratogen, suspected mutagen. It's use in interior house paints in the U.S. was prohibited in 1978.

References and additional information:

R.J.Gettens, H. Kuhn, and W.T. Chase, "Lead White", Artists Pigments, Volume 2, A. Roy (ed.), Oxford University Press: Oxford, 1993.

Review of Conservation Materials Database
(NPS Grant # MT-2210-8-NC-12)
Gordon Hanlon - 1 November 1999.

Summary

The database is an extraordinary achievement and will be an incredibly important addition for all people in the preservation field. It is bringing together a wide range of materials from many different specializations and will be useful for a wide range of users from students to conservation professionals. In addition to the information on each material, I think one of the most valuable aspects will be the reference section pointing towards additional information. Ideally the database will be added to and updated periodically so that new materials and references can be added.

Instructions for use

1. How to search the database –search strategies.

2. Current Material Safety Data Sheets (MSDS) should always be referred to before using a material.

3. List of abbreviations used in database.

Overall Database

I think that FILEMAKER PRO was a very good choice for the database. It is a reasonable straightforward database both with regard to designing the layout of the database and is easy to use. However I believe there are some limitations to the program, such as the ability to search several fields at once, which needs to be pointed out in the introductory instructions on how to use the database.

Structure

1. In the present version of the database it is not possible to minimize the database so that you can work on another program, eg: Microsoft WORD, without first closing the Materials database. Is this only because it is a working version of the database? It would be a great advantage to be able to work on other documents while having the database open.

2. Is it possible to have the menu of layouts (in the top left-hand corner of the screen) permanently visible in the form of buttons for different layouts at the top of the screen.

Searching

1. At the introductory search page there are three different fields which can be searched—name, synonym and description. Is it possible in Filemaker Pro to have only one search option that would search all three fields at once? I suspect that this is a limitation of Filemaker Pro but the problem at present is that you could search

under the main heading and not find the material you are looking for because it is in the SYNONYM field (eg: Campeachy).

For example: searching for **OAK** using each different search option gave the following results.

NAME	38 hits
SYNONYM	12 hits
DESCRIPTION	46 hits

The speed of the search seems to be the same in all three searches. If it is not possible to combine the searching of the three fields at once, it will be important to give clear instructions on searching at the beginning of the database.

2. On a few occasions I had problems finding items I was searching for due to different spellings. For instance searching for Polyvinyl alcohol or poly(vinyl) alcohol, produced very different results. For instance if search for Polyvinyl alcohol there were NO hits when searching the name and synonym fields and one when searching the description field for synthetic chamois leather. However if searching for poly(vinyl) alcohol in the name search mode the result is two references to the resin. However in other cases both forms of a word are entered and are cross-referenced, for instance, all records including **SULPHUR** or **SULFUR**.

3. A related problem may be that not all the names for a material will lead to the correct reference. One example I found was Urushi (a common word for oriental lacquer) did not find lacquer. There were no hits under the "Name" and "Synonym" searches and two hits when searching the description field were for **Oil gilding** and **Zirconium oxide**, but no hits for oriental lacquer.

Content

1. Very good. I searched many obscure materials and was very impressed by the coverage of the database. Inevitably there are materials that are not covered and I have been keeping a list of materials which need to be added. Adding materials to the database will be an ongoing process until and after the "final" version. How are the additions to be made? The reviewers can suggest new entries for materials not covered at present and can suggest additional references to support the entries. In addition it may also be interesting to allow users of the database to suggest additions. Suggestions for additions would then need to be sent to the person who was responsible for updating the database, who would review the additions for accuracy etc. and add them to the database.

2. I was surprised to see many entries for techniques, concepts and analytical methods were covered in the database such as abrasion, marquetry or absorption spectroscopy. Although I think that the addition of these categories will greatly enhance the dictionary, I think the first priority should be to complete all the entries and that concepts and techniques should be added latter. This could possibly be completed in the present project or as a separate future project.

3. For additional information on techniques it may be interesting to refer to the Groves Art Dictionary. This could be useful for information but could also be cited as a reference for further information.

4. All entries need to be checked by the appropriate reviewer for accuracy. I feel the best way for this to be done would be for each entry to be printed out separately and to be sent to the appropriate reviewer for comment on accuracy, omissions and especially additional references, especially with regard to its application in conservation.

5. Any reference to safety information should be dated. Fortunately safety limits for many materials are become tighter and dating safety information would warn any user of the database of how current and therefore accurate is the safety information.

6. For more information — Excellent that this field is included. The condensed format will in most cases be sufficient for many inquiries but a good reference to where to get additional information would be invaluable. See further comments see "References".

Applicability

The comprehensive coverage of the materials both found in objects and used for their conservation will make this an invaluable aid for all working in the conservation field. In addition to the information available for each material in the database, one of the most valuable aspects of the database will be the reference section for each entry.

References

1. The reference section is crucial. Are references only included which are directly associated with the chemistry or properties of a material? Or are references of where a material has been used for a particular conservation problem to be included. I am in favour of the latter but care will need to be taken when recommending articles that refer to treatments. Maybe a warning would need to be added at the front of the database that any references are <u>for information</u> only and are not recommended treatments.

2. More references should be added by the reviewers.

3. Are the two sources of the information used in the description of the database to be cited either in the references or elsewhere in the entries?

4. References will sometimes give valuable information on recipes or the use of a particular material, for instance Koob, S (1986) "The use of Paraloid B-72 as an adhesive for ceramics and other materials" *Studies in Conservation*, 31. The addition of such articles would extend the usefulness of the database.

5. Some references in the present version of the database were not complete. For instance the entry for **ABACA** has the reference "King, 1985".

6. Will there be an opportunity to update records in the future with new references?

How would this be done? Is there a way to link the database with AATA?

Function

1. On the computer screen I am using the database does not all fit on the screen. It is therefore necessary to scroll over sideways to read all the information.

2. Is there any way to have links between records? For instance, if you perform a search for "African Cherry" the record will say "see Cherrywood" and I wonder if it is possible to click on "see Cherrywood" and automatically go to that record.

Printing

When printing out records, the right side of the record is cut off.

Individual Entries

Content

The database is still in the process of being created but for some entries there does appear to be inconsistencies in the descriptions of the materials. I felt this mainly for the descriptions of woods. This is always a very difficult area because woods always have so many different names and often common names can refer to two completely different species.

Trade names need manufacturers name, address etc.

Units

1. What units are used for density? The record for English Oak used the units "ppcf" — pounds per cubic foot. It might be good to include a key of any abbreviations at the front of the database.

2. CAS # . List in abbreviations — Chemical Abstract #.

Format

1. Wood records. The standard method of describing woods is to use the woods name first, followed by its geographical origin. eg: Walnut — followed by European or American. In this way the database shows groupings of the same genus from different geographical locations which I think is useful if browsing the database.

2. All wood entries need to be reviewed. There are also many additions that need to be made.

Completeness of records

1. I reviewed the information on the different species of wood in the database. The information varies considerably for different wood entries with some being more complete than are others. In general I think the records for wood are adequate but could be improved by the addition of some information. In general I think a good checklist for woods should include…

a. Genus and species name
b. Color
c. Geographical location – where it grows!
d. Hardness
e. Grain – type, size, distinctive features
f. Odor
g. Specific gravity (air dry)
h. Weight per cu foot
i. Use – timber or as a source for resins or dyes for instance.

Recently I have come across a book called "Commercial Foreign Woods on the American Market" by David A. Kribs, Dover, 1968. This is by far the best book that I have ever seen on this topic and the descriptions and the listing of alternative names for woods is unparalleled. In addition the book "World Woods in Color" by William A. Lincoln, Linden Publishing, 1986, is also very good and complements the Kribs book. I think these two books should be used for checking the wood entries.

Additional comments

Is there any possibility to add images to the database in the future? I know that images can be incorpprated into Filemaker Pro records although there may be problems with the increase in file size. However, if it was possible it could be useful for woods – both macro and microscopic pictures of structure.

Optimum manner for distribution of database:

It is crucial that the database is searchable. That is the great advantage of a database like Filemaker Pro and the way you have designed the database so that all fields can be searched. It is so important because of the many different names which materials have, or the connections between materials that may not be apparent with a non-searchable or hard copy. A hard copy would be useful BUT if funds were available to continue to add and update the database obviously a digital version will be better. The ideal distribution for the database would be a searchable web version that could be continuously updated. However there are benefits in a CD-ROM version, which could be permanently housed on a users computer and would not require web access. Of course the disadvantage is that this version could not be updated.

NCPTT Grant MT-2210-8-NC-12
Pamela Hatchfield, Head of Objects Conservation, Museum of Fine Arts, Boston

5 October 1999

Michele Derrick
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Review of Conservation Materials Database

General Comments on Overall Design

The database is a very impressive undertaking that will be a great contribution to research efforts of art historians, conservators and other scholars. Working with the database has been extremely interesting and useful. In general, I found information in it easy to access and a good core of basic information on the topic available under each heading. Both the level of its usefulness and any potential difficulties in the database stem from the magnitude of this undertaking.

I was unable to view the entire layout at one time on my computer at home – perhaps there is a way to correct this, or perhaps my computer screen is too small. Scrolling across the page is inconvenient.

I presume a set of instructions on the use of the database will be provided.

Some of the sources are rather time-sensitive, since for example vendors may go out of business (eg. Conservation Materials) or commercial products may change formulation without notice. I suspect for these reasons that the updating process will need to be ongoing. A statement to this effect should be made in introductory information. This points to a larger issue: in light of the new information continually made available in many areas covered by the database, the document should be considered a flexible entity, one which is under continual refinement and growth. This inherent characteristic would be well supported by a flexible format such as a web site, and would make the information available most current. The database would fulfill its greatest potential and usefulness as a much larger entity than as it was originally conceived.

No other programs were visible/available on screen when using the database, so for example if I was running Microsoft Word, I was unable to determine whether it was possible to copy information from the database into a word processing document. This function would be extremely useful for researchers.

General categories of search provided incomplete information which could be accessed in other ways; I wonder whether these are of greatest usefulness, or will simply mislead the more casual user of the database.

Content

Some of the architecture entries found in only one reference seem to be of limited applicability to the field of conservation, although admittedly this is not my area of expertise; for example, bituminized fiber pipe, black iron pipe.

All the information for a single name and its synonyms should be available in the same search, rather than having to search the name and its synonyms separately. I understand that the database is not yet complete, but found only a few entries when I typed in a general topic such as "ceramics adhesive"; this would, for example, lead the unititiated to assume that we only use cyanoacrylate to adhere ceramics. Also, "consolidant" gave some terms and some materials, but, for example, no stone consolidants came up (I was looking for silanes), and when "stone consolidant" was searched, only the term "absorption" was retrieved. Other terms such as "fillers" retrieved spurious entries such as "Calgon", but not microballoons, a common filler in use today. Searching "microballoons" did not produce any hits, but I found it under microspheres as "Micro-Balloons".

It would be useful to be able to see the reference(s) on the database entry itself rather than having to move to another page. Page references will be important to researchers.

Proprietary products should have qualifiers attached to descriptions, especially if they come from commercial catalogues (eg. "Bookkeeper" or "Wei-T'o"), as manufacturers may make unsubstantiated claims which practice or research does not support.

Editing and corrections are of course needed. Copy editing to remove typographic errors, etc. is straightforward. Editing to complete content in each entry seems to be a protracted process, one which can continue indefinitely after the database is released. As new literature is published, references and additional information will become available that should be incorporated into the database. This will no doubt require numerous editors for each area of the fields covered.

The inclusion of U.S. trade names for materials (and they <u>should</u> be included) raises the issue of inclusion of common trade names from other countries, and possible eventual production of other country/language-based versions.

General recommendations

The database is a much needed compilation of information on the materials of art, architecture, artifacts and materials used in conservation. It will certainly become one of the most well-used reference tools in the field of conservation.

I strongly recommend the production of the database in both CD-ROM and in printed form, as many researchers would find the latter format extremely useful as well. However, this format necessarily limits the timeliness of information provided. I can envision a CD-ROM version published with the print edition, and updates provided on the web site. Perhaps one could subscribe to the database and thereby be provided with print edition, CD-ROM and yearly access to the web site for updates. I imagine that substantial funding would be required for this manifestation of the project.

It will be important to make references as complete as possible, with page numbers for each.

Release on a regular basis in printed form (probably best as a simple alphabetic dictionary), CD-ROM and consider the development of a web site which could include the most recent version of the database as well as updated information. Researchers could subscribe to this. This capacity to update is particularly important in the area of health and safety information on chemicals used in conservation; perhaps the web site information on these materials can be linked to CAS numbers, the Hazardous Materials Database, MSDS or other resources which are continually updated.

Acronyms: CMD – or CDR, Conservation Desk Reference, like the Physicians Desk Reference, PDR, not a bad thing! Or: CMD, Conservation Materials Database, or CAMD, Conservation and Materials Database? CAAMD, Conservation and Art Materials Database?

Congratulations on an excellent and much needed resource. The database is well organized and well-thought out. It has been a privilege to assist in the process of its development. I look forward to using it in the future.

Pamela Hatchfield
Head of Objects Conservation
Museum of Fine Arts, Boston

Review of the Conservation Materials Database

Teri Hensick, Conservator of Paintings, Harvard University Art Museums

Summary

The Conservation Materials database answers a need for easily accessible technical information and concise definitions for materials used in the making and treatment of artistic and historic works. It will be a very helpful tool for practicing conservators, conservation scientists, curators, art and materials historians, and producers and providers of artists materials, not to mention for artists themselves. It effectively combines terminology from scholarly, scientific, historical, industrial and craft sources. To have all of this information available in one comprehensive book/ CD-ROM/ or Internet site will be invaluable.

The database is easy to use and very well designed. It provides a brief definition of each term which is comprehensible to the non-scientist. Starting with the general type and use or biological source of the material, it proceeds to the key characteristics of the material. The industrial uses for the material are usually included prior to any particular use which might be related to art objects directly. Synonyms for the term defined are listed directly under the definition. These are cross-referenced to the main term. Eventually this field could he expanded to include terms in other languages (see "Recommendations" at the end of this review).

The most important chemical and physical characteristics of the material are summarized in a table which provides information important to conservation scientists and conservators. This is followed by a section for hazards which is especially useful for the practicing conservator (and artist), who could use the database as a short but complete reference to the known hazards of materials that might currently be in use.

Each definition is followed by a section for "further information" or references to key literature on the material in question. This leads the reader to the most important articles or notations about the material. Thus the Conservation Materials Database can serve as an important research tool which will considerably aid anyone looking into a particular material for the first time. This feature of the database is particularly useful for further research into materials and is one of the great strengths of the database.

Structure

The database design is clear and logical. It is divided into "browse" and "search" functions. The "browse" function provides a complete alphabetical listing of all of the entries. Intuitively the user sees that the description following a word can be read by clicking on the entry sentence. (In my computer the word and description are one or two characters longer than the size Of the field, making it necessary to use the scroll bar along the bottom to see the entire word and its definition. If possible, this should be changed). The "full record" option brings up the expanded record for the term. By pushing the "browse" button along the bottom scroll bar one returns to the same place in the alphabetical list. (This might be clearer if, instead of "browse" this were simply a "back " button).

The "search" function in the database is well structured and clear. Four different searches are possible- by name, synonym, description and classification. The classification-fields are quite broad. More detailed classifications could make this search field more powerful. For example, a paintings conservator might want to look at all of the different resins used for varnishing paintings. Currently these are divided into the "oil/resin/wax/gum" field (464 entries) and the "polymer/adhesive" field (340 entries).

One minor change relating to the database structure would be very helpful. When it is opened, the Filemaker database program blackens the computer screen, making it impossible to click back and forth from the database to another open program on the desktop. It would be handy to be able to move easily into another program, if possible. I imagine, the database as an icon on the desktop, that would be clicked open and consulted on an almost daily basis.

Content

The content of the database is excellent and wide ranging. With over 9000 terms, it promises to be a primary source for information in the field of art conservation and conservation science.

Amongst the terms included in the database are commercial products that have gone out of use or nearly gone out of use (e.g. FomeCor). The conservation database will be the first database to gather these materials in one place. It should include as many of these materials as possible. Many of the products are familiar to a few conservators in a local area. Yet they are referred to in conservation reports, either from the past, recent past or present. Often, there is no description of what they consist of, in the old conservation reports . The conservation materials database will help conservators now and in the future to decode old condition reports and to be better able to have an idea of what may have been used on a particular work of art.

As a paintings conservator, I would very much like to see commercially available paints used in the field of conservation included in the database. This may be quite difficult, since paint manufacturers have not and often do not provide information on the their paint formulas and often change formulations. Nevertheless, it would be valuable for paintings conservators to have a reference which defined the various inpainting materials likely to be found in an old treatment report.

Other terms, used in the past but not common today, might also be included. One example is "MI2" (shorthand for a combination of solvents commonly used for varnish removal at the Fogg in the 1960s). The database could be a repository for such terminology.

Applicability

The conservation database will certainly be used on a daily basis by conservators and conservation scientists. It will be a fundamental tool for checking the composition of solvents or pigments in use in the lab, for looking up hazard information on materials, for clarifying old records, and for. teaching purposes. It will also be a first step in checking

references on materials or researching the composition of unfamiliar materials. The database will be of great interest to other specialties such as art historians interested in the materials and techniques used in the making of works of art or artists concerned with the materials they choose.

Function

The database can function as a quick source of definitions, chemical formulas, class, geographical or biological source, manufacturer, dating, composition and characteristics, hazards, synonyms, and usage in industry or conservation. It can also function as a primary research tool to guide investigators towards key literature on the materials in question.

Entry Selection

The choice of terms defined is wide reaching. I do not think any of the terms chosen are superfluous. If the database were to be made even larger, I would like to see terms specific to the tools and procedures used in the production of paintings and in painting conservation. Since all of the fields of conservation would need to be given the same importance, however, this would mean a major redefinition of the database. Therefore, I think it is perhaps best to limit the database to the current selection of entries, rather than to make it significantly larger. Later editions of the database could emphasize the tools and methods used in making and conserving works of art.

Individual Fields

The design of the individual fields is clear and complete. The format of the "Properties" field, which is presented in a table, allows for quick comparisons with other materials. The table presents only the most important data on a particular material. Anyone needing more information can turn to the references cited in the "further information" field. The "search" field pulls up terms and their synonyms quickly. The hazards field is an excellent inclusion in the database. It is very important that this field be as complete as possible in the final version of the database. It would be crucial to indicate when a hazard is unknown since the database could be used to judge the safety of a material in use. There should be some shorthand indication for materials whose hazards are unknown - lack of information in this field might be interpreted as a positive comment on its safety as a material. Where applicable, the MSDS sheets could be referred to. Where not applicable some comment could he made - such as "hazard unknown", if there is any doubt about the safety of the material.

RECOMMENDATIONS

1. Editors. The database needs an editor for typos and miscellaneous errors.

2. It would be useful to have at least two editors in each field(paintings, paper, objects, textiles, conservation science etc.) to be certain that the most important uses for a particular material related to the field of conservation are listed for those terms which are used. In addition, editors from different geographical locations would be very useful. For example, a paintings conservator from Boston and one from Washington DC, for example, may not he familiar with the same materials.

3. Though not within the scope of the current project. I imagine this database could become a multilingual tool. A starting point would be to include foreign names in the "other names" category of the "full record". If this field were searchable, foreign conservators could use the database to find English definitions for whatever they were searching for. For example, a German speaker searching under "grune erde" would find "green earth". A possible starting point for such a project would be to have the database edited by multilingual conservators.

4. Along those same lines, a material known in the United States under one trade name could be linked to its European counterparts using the "other names" category . Thus, a European searching for "Melinex" in the "other names" category would find the US equivalent "Mylar".

5. I would like to see the database produced as a CD-ROM (or comparable format). As a book, though it would be very useful, it would not be as easily searchable and sortable. I also envision it as something one would want to have on hand, copied to a desktop for quick access and reference. If it could be searchable on the internet, this might also be an excellent alternative.

6. Possible Acronyms for the "Materials Conservation Database": CODA, MCD

October 26, 1999

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Review: Materials Database

The Materials Database will no doubt become one of the most important references in the conservator's library, bringing together in one source information about an encyclopedic range of materials; including their definition, chemical and physical properties, and literature citations for additional information. Conservators routinely consult a wide range of sources for information pertaining to the materials that comprise a work of art or those that are being considered for its treatment. The Materials Database will expedite this search. Whether looking for a definition of an unfamiliar term, comparing and contrasting the properties of two materials, or seeking an alternative source of information about a material, the Database can provide the answers. It will also provide an important historical reference for documenting the materials used in conservation treatments.

Overall Design

While placing the data in an alphabetical format is the most logical and lends itself to a book format, retrieval of information within the database format is critically important and should be retained in the final distribution of the Database as a CD-ROM. The computer has already become an extension of our libraries, and this format lends itself to timely updates of the information within the database.

The overall design of the database around "browse" and "search" functions is quite helpful. The browse function in particular worked well, and it was possible to move quickly through the document, despite the large number of entries. The search function, however, did not work as well. Description category searches pulled up an incomplete list of entries, for example:

- Search for "textile adhesive" (for adhesives used in the treatment of textiles) in the description category brought up 22 entries but did not include important ones used in the conservation of textiles, including Mowilith, Vinammul, Elvace, Beva, Wheat Starch paste, etc. It is important that the definitions be formatted to include key words to facilitate searching. Although many of these adhesives are in the database, they are not necessarily listed as being used for the conservation of textiles.
- Similar search for "textile detergent" yielded six entries, but omitted important ones such as Icepal and Triton-X.
- "Conservation support fabrics" search did not have any match, "support fabrics" had a few, though none used in the support of textile objects, such as crepeline or stabiltex.

Individual entries

In addition to the overall search problems mentioned above, successful development of the search function will depend on complete and accurate information in individual

entries. While some materials appeared within the database, specific uses (for example for textile conservation) may not have been listed and therefore not retrievable as such. Citations were not present in many cases. *CMC* is an example, a cellulose derivative that has widespread use in many conservation disciplines. Its use as an antiredeposition agent in the washing of historic textiles was widely embraced within the field of textile conservation after the research of Judith H. Hofenk de Graaff, a use that is important to note in the database and for which there are several citations. Similarly, EDTA has uses listed in the database related to cleaning of metals and objects, but not to textiles, although it was presented in an AIC Specialty Group (Adler and Eaton, 1995) paper for use with cleaning textiles with stains caused by metal ions in previous wash baths. Other obvious omissions, such as Lissapol N and C detergents may have been due to their widespread use in Great Britain and not in this country; however others common in the US should be included, such as the widely used non-ionic detergent Icepal.

It appears that Rosalie Rosso King's book was used extensively for data. It would perhaps be preferable to use sources that offer a full analysis of the topic of fiber identification such as J. Gordon Cook (*Handbook of Textile Fibers*) and their preparation for manufacture into textiles, such as Marjory L. Joseph (*Introductory Textile Science*).

Some of the entries simply need clarification, for example *rabbit hair*, defined as…"fluffy, warm felt fabric." Rabbit hair has specific chemical and physical properties and optical characteristics, which would be useful in the entry, as do all the fibers. It is used in a number of different weave structures, both woven, knitted, and possibly even felted (nonwoven); to characterize it as a "felt fabric" is inaccurate, and as "fluffy and warm" not particularly useful.

In summary, the foundation for the database is well placed. Additional work is needed on individual entries to incorporate commonly used conservation materials, to edit the existing definitions, and to ensure the use of key words for ease in searching data. Citations should be included as much as possible.

Respectfully submitted,
Meredith Montague
Associate Conservator

Review of Conservation Materials Database

Reviewer: Ivan Myjer, Principal, Building and Monument Conservation, Arlington, MA

October 26, 1999

Introduction:

In the spring of 1999 I was asked by Arthur Beale, Director of Conservation for the Museum of Fine Arts to participate in a grant funded project headed by Michelle Derrick, Conservation Scientist. The project was funded by the National Center for Preservation Technology and Training and the Museum of Fine Art Boston. As a contributor, I participated in the project by supplying bibliographic references for sources of terms that could enter the database in the architectural and mineral categories. As a reviewer, I participated by reviewing definitions included in the database and commenting on the overall format and utility of the database.

My architectural conservation practice is focused on the conservation of masonry buildings and architectural stone sculpture. In particular, I am focused on traditional masonry construction and the structural problems associated with conserving these types of buildings. However, on some projects, for example, those that involve the conservation of the exterior of a historic building as well as the conservation of interior decorative schemes and the collections housed within the building, I am frequently asked to coordinate and evaluate treatments proposed by conservators from other disciplines. In the past, as director of one of the regional conservation centers, I coordinated and supervised the work of architectural conservators, building conservation craftsmen, objects conservators, mural conservators, paint conservators, upholstery conservators and furniture conservators. The Conservation Materials Database is, for me, potentially an invaluable tool, useful not only for looking up terms and references within my own field, but also for evaluating materials, terms and eventually treatments used by conservators from other disciplines.

Aside from my own uses and the use of other conservators I anticipate that the database will be very useful to the teams of architects, engineers, historians, archeologists, scientists and conservators who investigate historic buildings in order to produce Historic Structure's Reports. One of the challenges in drafting, or evaluating, a massive report pulled together from the work of researchers from different disciplines is understanding the terms used by the professionals of each field. It is not uncommon for one researcher to refer to a material by its component parts while another refers to it by its trade name or the historic term that was used when the structure was constructed. The Conservation Materials Database has made a good start at listing materials by their component parts, trade names, historic names, chemical components and historic and contemporary uses. If the database can continue to develop along the present lines I think it will serve a useful purpose by helping to give individuals involved in the care of cultural property, regardless of their training or background, a common set of terms and references. The Conservation Materials Database differs from existing handbooks or glossaries firstly because of its interdisciplinary approach and secondly because of the manner in which it

is structured with layers of information accessible to individuals with differing backgrounds and requirements.

Structure and Format:

The current format of key terms with short definitions that then expand with the touch of a cursor to longer definitions is ideal for users who may be partially familiar with a term or not familiar at all. The format allows the user to skim the database and then plunge deeper into the meaning, uses and components of a specific material or process. In evaluating a digital format against a printed one, a printed version would not offer the same flexibility or ability to extract specific information on an entry without first digesting the entire entry. A printed version however would offer additional uses in the field for individuals working without or with limited access to computers.

I do not have enough experience to evaluate either alternate database formats that might be appropriate or the potential downside of putting a database such as this on line. I also do not have enough experience to anticipate if, or how, the current format might be hindered as the database expands.

As the database grows it seems to me that certain terms or materials should be bundled with other terms or materials under topic headings. For example currently, each type of marble quarried historically in Vermont is listed alphabetically by the common or trade name of the stone. If all of these entries were bundled under the heading "Vermont Marbles" I think the database would be easier to browse.

Content:

The terms in the two sections that I reviewed systematically, architecture and minerals section are very well defined when the entry is a material but less well defined when the entry concerns a process. For example, aggregate, cement and lime, components of mortar are well defined as materials in the database. The definitions however for making mortar and the processes involved such as slaking lime, mixing the ingredients and curing the end product are a little confusing. The Conservation Materials Database must find a way to strike a balance between the type of entry that would go into a glossary and the type of entry that might be found in a textbook or encyclopedia. Some processes simply have too many variables to lend themselves to easy summary.

A second concern that I have with the content of the database is whether it is necessary to duplicate the entries of existing glossaries and handbooks. The practice of architectural conservation for example involves the use and understanding of thousands of technical terms for describing architectural elements such as lintel, architrave, boss and chase It also involves thousands of materials ranging from hundreds of different types of stone and species of wood to, in the 20th century a host of synthetic products and a seemingly infinite number of ways of combining them. There exist at the moment a number of glossaries, dictionaries and handbooks on architecture terms. There also exist a number of

books, both in print and out of print, for sources of building stone and timber. The primary challenge for the Conservation Materials Database is to determine what should be included and what can be excluded, not because it is not important but because it exists in a readily accessible form elsewhere. The inclusion of a bibliography in each section of the database could help mediate between the potential number of terms that could be included in the database and the actual number included.

Recommendations:

In reviewing the entries included in the architecture and mineral sections of the database I was struck by the number of materials or terms that despite twenty-five years of working on buildings, I was not familiar with. While this speaks well of the content of the database it also speaks to my, or any one person's, ability to review the database for either accuracy of the definitions or scope of the individual sections. In time, I think that what is required is an editorial board of contributors and reviewers. The ideal board would be interdisciplinary in nature, composed of specialists and generalists. The role of the board would be to evaluate entries for content, particularly those that define a process rather than a material, and in addition help decide on what should be included and just as importantly, what should be excluded.

Conclusion:

The Conservation Materials Database is potentially an invaluable tool. It fills a void precisely because it is interdisciplinary, detailed enough to inform specialists but organized in such a way as to be useful to generalists as well. In addition it is easy to use.

Perhaps it is possible on the long term for the database to be broadly comprehensive but on the short term there are some key decisions that must be made as to what to include and what to exclude. The tension lies between listing a larger number of entries and defining a smaller number of entries more thoroughly. The decision as what to include and what to exclude as well as evaluating the accuracy of the definitions requies the input of a number of experienced individuals.

Review of Conservation Materials Database

Submitted by Roy Perkinson
Head of Paper Conservation
Museum of Fine Arts, Boston

November 30, 1999

General Comments

Ms. Derrick should be congratulated on this remarkable project. She has managed to design and flesh out a database that encompasses many of the materials encountered by the conservator. Its simplicity helps insure that it is easy to use, responsive, and informative. In this regard, it is quite successful, even at the present stage of its development, compared to other efforts with which I am familiar. As it is conceived, it will eventually fill a specific need in the field of conservation, which has become so complex, specialized, and filled with highly technical terms and materials that it is often daunting for the individual practitioner to know where to start in a search for relevant information. I applaud the decision to build the database on a widely used and famously user-friendly product, FileMaker, which, while simple and straightforward, is effective and responsive. (I have constructed databases with both FileMaker and MSAccess, and continue to find that the former is a very efficient program both for the designer and the user, especially after it expanded from flat file to fully relational capability.) In general, Ms. Derrick has launched a terrific idea which, with continued work and input, will undoubtedly become a favorite "Swiss army knife" tool for conservators everywhere.

Specific Comments

The concept of the database is good — to create an easily accessible source of information that will help the conservator find basic explanations and definitions about a wide variety of materials which may be known under several names, some traditional, others technical. Having spent some time "challenging" the database to yield information on a number of subjects, I remain impressed by the sheer quantity of knowledge that Ms. Derrick has managed to include. Some who have commented on the database suggest that it is unfortunate that it doesn't include more on procedures and techniques of conservation. I disagree somewhat with this assessment, but in trying to articulate exactly why I disagree I think I came to a better understanding of what such a database should be.

To some extent, the term "database" may even breed some difficulty. Fundamentally, this product is not so much a database as it is a "finding aid" or "dictionary" that is constructed on the framework of a database. It makes good use of the ability of a database to search quickly through a field containing certain kinds of information and thereby enhances its usefulness, unlike, say, a traditional index in a book. In my daily work, the kind of information I am most likely to need to obtain — and the kind that is often most difficult to unearth — has to do with the definition of some material, its composition, and how to find out more about it. While techniques and procedures are, of course, of enormous importance to the conservator, I am skeptical that such knowledge is

best presented in a format of this kind. Rather, a catalogue of the kind already produced by several specialty groups of the AIC is more congenial as a means of conveying procedures.

It also occurred to me that this database — I'll dub it the "Conservation Materials Dictionary," or CMD for short — is likely to be used most by someone who is trying to locate a basic definition of some material that is not ordinarily encountered in his or her own specialty, and who hopes to find signposts toward more information on that material. As I was using the CMD I had to keep reminding myself that it cannot be a substitute for the twenty shelves of reference works in my lab. After all, one is likely to know far more about one's own area of specialization than would be possible (or desirable) to include in any database format, or at the least is likely to know where to go to find the information. For this reason, the part of the database I found most fascinating was generally in areas outside my own. When I opted to browse through classifications such as fiber/textile/leather, architecture, or environment, it was hard to stop reading entry after entry because I kept finding myself saying, "How about that! I didn't know that!" I didn't really expect to have fun reviewing this! On the other hand, within or tangent to my own sphere I also found that I enjoyed occasional notes about the date when something was first introduced, whether it was masking tape or cellophane, and that this was a pleasant "bonus" to be had in strolling through largely familiar topics. The guiding principle in further development of the CMD should be that it will continue to be an "enhanced dictionary": a source of good definitions augmented with references to sources for further information.

Regarding the current design and functions of the CMD, I have a number of observations and suggestions for future consideration.

- The program installed easily and was invoked on my PC (Pentium 166 MHz processor, Windows 95, 32 MB RAM, with a 15" monitor) without difficulty. Once the program was operating, however, it prevented access to the desktop, preventing one from alternating between other tasks such as word processing. This is at the very least an inconvenience in that it makes it hard to refer to the CMD easily while engaged in other computer tasks.
- There are fairly serious problems with the display of the various views in the program. In all layouts it was constantly necessary to scroll up and down and left and right in order to read the entire page. I don't know what kind of system was used in the initial design of the database, but I suppose that the display was set for a higher level of resolution than my PC. If so, it would be helpful to the user to say something about how the resolution of the monitor should be set.
- An introductory page or layout with instructions about how to use the CMD would be helpful. A button (and associated FileMaker script) could be made to take the user to the "Search" layout.
- There are problems with printing. When I first printed out a record, much of the right side of the information was missing. This suggested to me that I needed to bring up my printer settings and change the format to landscape, but it is possible that another user might need some "coaching" to select the correct setting. Having selected landscape format, however, the result was still unsatisfactory (see attached printouts).

Some of the text at the right was still truncated, and a second page was printed out (it was empty of text, except for the header and the image of the buttons across the bottom of the page) even though the database indicated that I had only found one record.

- There are a few quirks that suggest that some procedural instructions would be useful. I tried a search for a word that turned out not to exist in the Name field, and this returned a message, "No records match this request." If one then hits "Cancel", the Search page is somehow disabled so that clicking on any button produces a message, "The field is not modifiable." The solution in this case is not to use the "Cancel" button in the first place, but to select the "Modify Find" button instead. It also turns out not to be possible to check more than one box under "Classification." In this regard, I think it would be a useful feature to incorporate the capability of Boolean searches, i.e., to be able to use "or," "and," or other similar operators. There is a de facto "or" function in the "Description" field, as it appears that the database will search on any words typed into the entry slot. I could imagine that it could be useful to do a compound search that might include the word "adhesive" in the "Name" field, and a check mark in, say, the "Paintings" field, thereby limiting the search to only those records that would relate to adhesives as they pertain to paintings.
- As a default, the database will search for any words that contain the word entered in the search field. For example, entering "alum" will return results such as alumina, aluminum foil, and aluminum. This can be especially helpful if one only has a vague idea that the word one wants to identify might contain certain letters. On the other hand, it would sometimes be helpful to limit the search only to a particular word. In this example, if one only wanted to get a definition of the word "alum," obtaining a larger group of words each of which contains "alum" is not helpful. It is common practice in databases to be able to use quotation marks to indicate that the search should be conducted only for an exact match of the specified word, but this is not possible in the current version of the database. In another example, typing in merely the letters "tess" leads to "tessera." But if one types in "tesserae" (the plural form of "tessera") the database finds no records. Perhaps in a set of instructions the user could be coached to try various portions of words if an initial search is unsuccessful.
- An editor needs to attend to certain problems of consistency. A search for "amate" has nothing entered under the heading called "Other names," but in the text directly above it says that one should also see "amatl." If so, it seems to me that it should be noted in "Other names." On the other hand, in the entry for "amati," in the "other names" heading it mentions "amate" and "Aztec paper." Selecting the phrase "adhesive, pressure sensitive" (found among the list for the "Adhesives" classification) produces "see 'pressure-sensitive adhesive'." A search on the latter returns the user to "adhesive, pressure-sensitive." To break out of this circular situation, selecting the phrase without use of the hyphen, i.e., "pressure sensitive adhesive" produces what is probably destined to be a more fruitful result, although at the present time the "full record" is blank and the "working record" contains quite a bit of interesting information.
- In the "Full record" layout, a portion of one of the adjacent records is also visible. This is rather confusing and can probably be corrected without difficulty (it's as if the "list view" format has been designated while doing the design in FileMaker).

- In the "Full Record" and "Working Record" views, the ruler across the top is unnecessary and takes up valuable screen space. There are buttons across the top that are grayed out and hence non-functional. These should also be eliminated. I would also suggest that the vertical panel along the left side be permanently concealed from view. This is a useful "trick" in FileMaker that will free up still more screen space. If certain functions (quick access to the other layouts, for example) are deemed desirable, it uses up less screen space to design small buttons that activate appropriate scripts.
- For general searches carried out under one of the main categories, it might be helpful to have a note somewhere that would remind one of which of the categories in which one is browsing.
- I suggest that the word "browse" that is seen while in the "Full Record" and "Working Record" views is not the best choice. Perhaps the button could be labeled "Return to List View," "View as List," "View Results as List," or something comparable might better describe the action.
- I find that it is an annoyance that a complete sorting of the entire database occurs whenever one exits the program. Instead, perhaps it would be better to have this occur only when one selected the "Browse" button on the home page, indicating that one would like to browse the entire database.

Final Comments

As an ardent fan both of databases and arcane literature on conservation materials, it has been a pleasure and privilege to try out the "beta" version. I am impressed that Ms. Derrick has managed to do so much while working essentially on her own. As she has said, more needs to be done, but this raises the question of how best to proceed with building on this excellent beginning. I tend to agree with those who have suggested that it might be good to consider enlarging the team of contributors in order to enhance the depth and usefulness of the CMD. With additional funding, a group of contributors could be convened regularly and, with the assistance of a coordinating editor, could push this project to the next level of excellence. It is tempting to think ábout whether funding for this effort could be forthcoming from the American Institute for Conservation (which offers some support for publications, and it could certainly be argued that the CMD is a "publication"), or possibly from the Getty Trust, especially if it seemed appropriate to produce a more international version in a few different languages.

Regarding how best to disseminate the CMD, it is especially tempting to consider "publication" via the Internet. Already there are countless databases to be found on the Internet, and the latest version of FileMaker is designed to be "web-ready." While I remain, of course, very fond of the book format, I am persuaded that the flexibility, ease of updating, and world-wide reach of the web, which is already becoming a "first stop" in the search for information, make it admirable suited for this purpose. Furthermore, it has the capability of hyperlinks to a virtually unlimited number of other related sources that could be added by the editorial board: links to other publications, sites relating to conservation, technical data from manufacturers, etc. The Conservation Materials Dictionary in its current form represents an exciting beginning with tremendous potential to become an indispensable tool for conservators throughout the world.