

Painting Historic Buildings: Materials and Techniques



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Cover photo: An early 19th century wall painting in the Elwin Chase House in East Topsham, Vermont, done by the itinerant painter Rufus Porter (1792-1884). This wall painting was discovered hidden underneath several layers of wallpaper during restoration. Photo: Richard Cote, Vermont Division for Historic Preservation.

Painting Historic Buildings: Materials and Techniques

An Annotated Bibliography

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Joan Janicki, an architect and graduate student in Historic Preservation at the University of Georgia, prepared the Reading List for publication by providing technical and editorial review, as well as bibliographic, archival and photographic research. Anne Grimmer, Preservation Assistance Division, National Park Service, served as general editor of the Reading List.

Reading lists have been published by the National Park Service, Preservation Assistance Division, since 1975. Most are selected bibliographies rather than a comprehensive overview of a particular subject. Some of the reading lists are annotated. Comments or suggestions for additions to the Reading List should be sent to: Preservation Assistance Division, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127.

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Table of Contents

Acknowledgements	ii
Introduction	1
Historic Use of Architectural Paint	2
Historic Works on Methods and Materials	2
Historic Trade Catalogs and Pamphlets	4
Modern Works on Historic Paint	9
Analyzing Historic Paint	15
Introducing Paint Analysis	15
Analyzing on a Basic Professional Level	16
Applying Advanced Analytical Techniques	19
Considering the Nature of Paint	21
Repainting Historic Buildings	25
Diagnosing Paint Failure	25
Removing Paint	27
Preparing the Surface	32
Selecting Paint Type	34
Using Painting Tools	36
Applying Protective Finishes	37
Selecting and Placing Color	41
Painting For Decoration	44
Using Modern Guidebooks	44
Stencilling	45
Graining	47
Marbleizing	48
Glazing	48
Sand Painting	49
Health and Environmental Hazards	50
Conservation	54
Case Studies	55
Reference Works	59

Introduction

The restoration and preservation of a historic building usually requires the preservationist to consider several interrelated issues involving historic paint. Only rarely does a historic paint scheme of the desired period of restoration remain intact; a more typical situation involves the need to discover and replicate an original finish which may be hidden under many later layers of paint. Moreover, the preservationist must ensure that paint endures sufficiently well to serve its protective function, an especially difficult challenge on exterior surfaces which are constantly exposed to weathering. The annotated entries in this technical reading list address many of these issues.

The technical reading list is organized into six divisions. The first division addresses the historic use of architectural paint, including both historic (e.g., early trade catalogs) and modern works. The second division focuses on the process of historic paint analysis, on a variety of levels and also provides background information related to the physical and chemical nature of paint. The third (and largest) division covers the various aspects of repainting historic buildings: paint failure diagnosis, paint removal, paint and tool selection, the application of paint as a protective coating, decorative finishes (stencilling, graining, marbleizing, glazing, and sand painting), and health and environmental hazards. The fourth division focuses on a variety of cleaning and conservation practices. The fifth division presents several case studies involving historic paint. The sixth division provides useful reference works.

The majority of the works included in the reading list should be available at most large public or university libraries. For those rare historic works which might be difficult to locate, in many cases reprints are available. Such entries are marked with asterisks.

The single (*) asterisk indicates that the original work resides in the trade catalog collection at the Henry Francis du Pont Winterthur Museum in Delaware. These Winterthur materials have been reproduced as black and white microfiche by

University Publications of America (4520 East-West Highway, Bethesda, MD 20814-9699); printed guides to the trade catalog collection are also available through University Publications of America.

The double asterisk (**) indicates that the work is listed in Lawrence B. Romaine's *A Guide to American Trade Catalogs, 1744-1900* (New York, NY: Dover Publications, 1990). This book identifies the locations of the original works.

The Conservation Information Network (CIN) operates a bibliographic database which can be used to locate very specialized modern works relating to many conservation issues (including historic paint). In the United States, information about the CIN can be obtained from The Getty Conservation Institute, 4503 Glencoe Avenue, Marina del Rey, CA 90292-6537.

Given the complex interrelationships among the various aspects of historic paint, it is important to remember that some entries fit more than one category. Therefore, readers may find it necessary to check several sections of the reading list to find all the entries related to a specific topic.

Historic Use of Architectural Paint

Given the important role of paint as a protective and decorative feature for historic buildings, the preservationist must understand how paint was historically used on the interior and exterior surfaces of those buildings as a prerequisite for accurate restoration and preservation. Fortunately, a large quantity of historical information survives from previous times periods, and many modern scholars have documented the painting practices of the past.

Historic Works on Methods And Materials

The study of historic paint use begins with historic works which throw light on the painting methods and materials used in buildings. The following entries range chronologically from the eighteenth century to the early nineteenth century. They also range from aesthetic theories and comprehensive systematic guidebooks to very specific practical procedures (such as grinding and mixing pigments). Some listed works include information applicable to buildings, although they were ostensibly written for other purposes (e.g., carriage painting). These works are available as reprints of the original documents.

Allen, Edward B. *Early American Wall Paintings, 1710-1850*. Watkins Glen, NY: Century House, 1969 (Originally published in 1926 by Cambridge).

This book documents 39 examples of American picture panels and frescoes. Each listing gives a history of the building and a description of the wall painting.

Bettesworth, A., and C. Hitch. *The Builder's Dictionary*. Washington, DC: Association for Preservation Technology, 1981 (Originally published in 1734 in London).

This reprint of a 1734 builder's dictionary contains an entry discussing oil painting on walls, wood, and stone. Detailed instructions are given on techniques, processes, and materials involved in painting timber work. It also discusses how to measure and charge for work.

Candee, Richard M. "Preparing and Mixing Colors in 1812." *The Magazine Antiques*. Vol. CXIII, No. 4 (April 1978), pp. 849-853.

This article contains a facsimile of a pamphlet: *Directions for House and Ship Painting* by Hezekiah Reynolds, New Haven, CT, 1812. It gives proportions for pigments and steps for grinding and mixing.

Dossie, Robert. *The Handmaid to the Arts*. London, England, 1758, 1764, and 1798. (Current availability uncertain.)

This late eighteenth century guidebook of painters' materials and methods covers many arts, crafts, and trades.

Downing, Andrew Jackson. *The Architecture of Country Houses*. New York, NY: Dover Publications, 1969 (Originally published in 1850 by D. Appleton and Company).

Here Downing presents his theory on house colors. He gives instructions for painting in distemper and oil, and tones to be used in each room of the house. It also includes a list of Downing's approved colors.

Gardner, F. B. *The Carriage Painters' Illustrated Manual*. New York, NY: S. R. Wells and Company, 1880.

This book contains recipes and methods for painting and removing paint and varnish from wood, metal, and painting tools.

Gardner, F. B. *How To Paint Your Victorian House*. Watkin's Glen, NY: The American Life Foundation, 1978. (Originally published as *How To Paint*. A complete compendium of the art. Designed for the use of the tradesman, mechanic, merchant, and the farmer, and to guide the professional painter. Containing a plain, common-sense statement of the methods employed by painters to produce satisfactory results in plain and fancy painting of every description, including gilding, bronzing, staining, graining, marbling, varnishing, polishing, kalsomining, paper-hanging, striping, lettering, copying, and ornamenting, with formulas for mixing paint in oil or water: Descriptions of the various pigments used, their average cost, and the tools required in 1872).

The title mentions all the topics discussed in this small painter's manual.

Holly, Henry Hudson. *Country Seats and Modern Dwellings*. Watkins Glen, NY: American Life Foundation, 1977. (Introduction and index by Michael Tomlan. Originally published as *Country Seats*, New York, NY: D. Appleton and Company, 1863; and *Modern Dwellings*, New York, NY: Harper and Brothers, 1878).

In these two nineteenth-century books, here reprinted under one cover, architect Holly presents his designs for villas and cottages in the "Hudson River bracketed" style (*Country Seats*) and for "Queen Anne" houses (*Modern Dwellings*). In the latter book, Holly developed his theories regarding interior decoration: he presents an extensive set of guidelines on the application of colors to walls and ceilings. These popular books influenced the selection and application of paint colors used in residential buildings of this period.

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<p>Will cover more surface, do it for less money, and last longer than any other paint in the World.</p>	
<p>WILL NOT SCALE, CRACK, CHALK OR FADE. REQUIRES NO DRIER.</p>	
<p>And will arrest and prevent the rusting of iron and tin.</p>	
<p>1 lb. of Dry Paint and one gallon of Linseed Oil, will cover 500 square feet of Iron, Tin or Planed Wood. But one color made, "BROWN."</p>	
<p>FOR SALE BY THE SOLE MANUFACTURERS THE PRINCE MANUFACTURING CO., 71 Maiden Lane, New York.</p>	
<p>PASSAIC ZINC CO., MANUFACTURERS OF OXIDE OF ZINC, SPELTER, SPIEGELEISEN, MANNING & SQUIER, General Agents, 111 LIBERTY ST., NEW YORK.</p>	<p>STEVENS' PLAT BRICK RED and Practical Graining Colors, Are the original and only reliable articles of their kind offered to the trade. FOR SALE BY ALL PAINT DEALERS. MANUFACTURED BY THE STEVENS' PAINT SPECIALTY CO., Office, 100 Delancy St. Factory, NEW YORK. BROOKLYN, E. D. Beware of Counterfeits and Imitations.</p>

Advertisement for specialized paints from a 1888 issue of *House Painting and Decorating*.

Masury, John W. *The American Grainers' Handbook: a popular and practical treatise on the art of imitating colored and fancy woods; with examples and illustrations both in oil and distemper, by the author of 'How Shall We Paint,' 'Plain Talk with Practical Painters', 'Coach Painters' Companion,' etc.* New York, NY: J. W. Masury and Son, 1872.

This detailed how-to manual covers topics such as materials, tools, techniques, color mixing, color harmony, varnishes, and graining. Masury also comments on such things as the "niggardly economy" and "quackery in the trade". Fourteen color illustrations show oil and distemper graining.

Victorian Interior Decoration. Watkins Glen, NY: American Life Books, n.d. (Originally published as *The Paper Hanger, Painter, Grainer, and Decorator's Assistant* by Kent & Co., London, in 1879).

This is a valuable book for understanding how rooms were painted and which colors were used in the late eighteenth century. Topics include the following: colour in decoration and its use in various rooms, painting with distemper, painting with oil, varnishes and their use, gilding, ornamental glass, stencilling, decorating hints.

Wall, William E. *Graining: Ancient and Modern*. New York, NY: Frederick J. Drake & Co., 1972 (Third edition revised and enlarged by F. N. Vanderwalker. Originally published in 1905. Second edition published in 1955).

Wall's guidebook to graining gives detailed information regarding the methods, materials, and tools necessary for imitating over twenty-six different kinds of wood. Other chapters are devoted to overgraining, ceilings, floors, show panels, graining on glass, imitations of moldings, causes of cracking in grained wood, graining a door quartered oak, graining by mechanical reproduction, and representative decorative graining. Section two contains color plates of forty-eight examples of grained wood.

Waring, J. *Early American Stencils on Walls and Furniture*. New York, NY: Dover Publications, 1968 (Originally published in 1937).

Waring was the first person to thoroughly research New England stenciled walls. This valuable resource on stencilling is a reprint of the 1937 edition. It contains 130 plates showing patterns and the arrangement of stencils. Included are a history of stencilling and listings of tools and materials.

Historic Trade Catalogs And Pamphlets

Early in the nineteenth century, paint manufacturers began distributing catalogs and price lists covering their paints (illustrated with color chips) and related accessories such as brushes or other painting tools. Some paint companies also published pamphlets which, although primarily advertising devices, offer important information on historic application techniques.

In the following entries, the single (*) asterisk indicates that the original work resides in the trade catalog collection at the Henry Francis du Pont Winterthur Museum in Delaware. These Winterthur materials have been reproduced as black and white microfiche by University Publications of America (4520 East-West Highway, Bethesda, MD 20814-9699); printed guides to the trade catalog collection are also available through University Publications of America.

The double asterisk (**) indicates that the work is listed in Lawrence B. Romaine's *A Guide to American Trade Catalogs, 1744-1900* (New York, NY: Dover Publications, 1990). This book identifies the locations of the original works.

Alexander's. *Alexander's*. Chicago, IL: 1864.**

This resource is a catalog of Alexander's preservative paints. This paint was used specifically for steamboats, railroads, and buildings. Sketches illustrate the trademark showboat gambler holding four aces, representative of the Four Ace brand.

Allentown Manufacturing Company. *Allentown Manufacturing Company Catalog*. Allentown, PA: 1880.**

This illustrated catalog of ready-mixed paints by Allentown Manufacturing includes color samples and price lists.

Aromatic and Anti-Corrosive Paint Company. *Prospectus of the Various Paints for the Preservation of All Work Exposed to the Weather and the Interior of Houses*. London, England: E. Spragg, 1822.*

This pamphlet advertises the benefits of "Aromatic and Anti-Corrosive Paint." It includes claims of superior wood and masonry preservation. The largest portion of the pamphlet is a set of testimonials in favor of the product by prominent consumers.

Averill and Company. *Averill and Company*. Newburgh, OH: 1865.*

This source is possibly the company's first catalog. It provides a description of Averill's patented water-proof varnish paint and examples of the architectural decorative uses for the paints.

Chicago White Lead and Oil Company. *Chicago White Lead and Oil Company*. Chicago, IL: 1888.**

The illustrated price list covers the company's products for the years 1888 and 1889.

Davis, Chambers and Company. *Strictly Pure White Lead*. Pittsburgh, PA: 1890.*

This pamphlet describes the quality and guarantee of Strictly Pure White Lead. Illustrations include their registered trademark (the "green seal") as well as a detailed sketch of the factory.

Devoe, F. W., and C. T. Reynolds Company. *The Application of Paints and Varnishes*. New York, NY: 1911.*

This instructional pamphlet covers specifications and suggestions on painting, varnishing, staining, and enameling. It discusses wood fillers, shingle staining, egg-shell enamel, lead and zinc paint and more. A price list is also included.

Dornsife, Samuel J. *Exterior Decoration: Victorian Colors for Victorian Houses*. Philadelphia, PA: The Athenaeum of Philadelphia, 1975 (Originally published as *Exterior Decoration; A Treatise on the Artistic Use of Colors in the ornamentation of buildings and a series of designs, illustrating the effects of different combinations of colors in connection with various styles of architecture* in 1885).*

This is a reprint of a counter-top display book of ready-mixed paints published by Devoe Paint Company in 1885. It contains illustrations, color chips, and color keys. There is a new foreword by Roger Moss, Jr. and a new introduction and bibliography by Samuel J. Dornsife.

Du Pont de Nemours, E.I., and Company. *Principles and Practices of Up-Keep Painting*. Philadelphia, PA: E.I. Dupont de Nemours and Co., 1923.

This manual was written as a practical aid for plant superintendents or others responsible for the maintenance of industrial property, architects, and engineers. It includes paint treatments for interior and exterior surfaces of metal, wood, and concrete, paint preparation and application techniques, and information on spray painting and brush selection.

Egyptian Lacquer Manufacturing Company. *Egyptian Lacquer Manufacturing Company*. New York, NY: 1896.**

This illustrated catalog includes descriptions and a price list for clear and color lacquers of the Egyptian Lacquer Manufacturing Company.

Heath and Milligan Manufacturing Company. *Best Prepared Paints*. Chicago, IL: 1885.*

This illustrated sample book presents shades of Best Prepared Paints. Illustrations represent homes with different color schemes indicating the importance of color combinations in the Victorian period home.

Johns, H. W. *Asbestos: Liquid Paints, Roofing and Asbestos Materials*. New York, NY: 1893.*

This descriptive price list covers all of the products of the H. W. Johns Manufacturing Company in the 1890s.

_____. *Liquid Asbestos Paints*. New York, NY: 1881.*

This product claims to be the "most economic and durable paints ever produced." The work describes more practical uses of this strong paint which was originally designed for the preservation of tin roofs, railroad buildings, and seaside structures. Color plates are included.

Johns, H.W. Manufacturing Company. *Artistic House Painting*. New York, NY: 1893.*

This illustrated guide creates harmony with paint and architectural styles. It includes a listing of exhibits of H. W. Johns paints at the Columbian Exposition in Chicago.

_____. *H. W. Johns Manufacturing Company*. Chicago, IL: 1896.**

The illustrated catalog of paints for exterior decoration of homes and commercial buildings includes color samples.

Johnson, S. C., and Sons. *The Proper Treatment for Floors, Woodwork, and Furniture*. Racine, WI: 1913.*

This illustrated instructional catalog covers finishing new and old floors with Johnson's products. Color samples and price lists are included.

_____. *Various Woods Finished with Johnson's Artistic Wood Finishes*. Racine, WI: 1910.*

This source is a catalog of color samples and distributor locations.

Longman and Martinez. *Longman and Martinez*. Brooklyn, NY: 1885.**

This illustrated catalog and price list covers paints, oils, and varnishes of the Longman and Martinez Company.

Lowe Brothers Company. *Counter Price and Color Book*. Dayton, OH: 1900.*

This book includes illustrated samples of paint schemes on different architectural styles. Color samples of this ready-made paint apply to many surfaces, such as aluminum, floors, carriages, decks, and walls are included.

Lucas and Company, Distributor. *Gibbsboro Color Varnish Company*. Gibbsboro, NJ: 1887.**

This price list chart provides interesting insight into the historical prices, names, and uses of paints and varnish.

Masury and Whiton. *Globe White Lead and Color Works*. New York, NY: 1870.**

This illustrated guide includes price lists and color samples of this company's all-purpose paint. Railroad colors and ready-made paints are the more important features.

Masury, J. W., and Son. *Confidential Net Price List for 1885*. New York, NY: 1885.*

This price list, distributed in 1885 by Masury to paint dealers only, provides a historical paint pricing and naming guide.

_____. *John W. Masury and Son*. New York, NY: 1871.**

Established in 1835, Masury and Son published this illustrated catalog of pure white lead, zinc and other paints. These paints are considered for the purposes of artists and decorators of ornamental work on all types of dwellings.

_____. *Masury's Pure Linseed Oil House Paints*. New York, NY: 1890.*

This illustrated guide recommends choosing house paints according to price and style of home. It reveals the importance of choosing house colors in the Victorian period.

_____. *To All Consumers of Paint*. New York, NY: 1890.*

This informative pamphlet, addressed to the home owner and other consumers of paint, presents an argument in support of Masury Ready-Made Paints. Features of these paints include its economic nature, durability, preservative features, and uniformity.

Match-O-Stain. *Processed Coloring Compound: For matching-up, blending, and color-padding*. New York, NY: H. Behlen and Brothers, 1945.*

This illustrated catalog of Match-O-Stain's coloring and staining products includes directions for the use of these products for renovation of clear wood finishes. Also included is a price list with descriptive color names. This company began in 1888.

Moller and Schumann. *Moller and Schumann*. Watson, NY: 1880.**

This illustrated price list describes appropriate paints for interiors and exteriors. Consideration is also given to varnishes for coaches and furniture fillers.

Moser, Charles, and Company. *Charles Moser and Company*. Cincinnati, OH: n.d.**

This illustrated price list of paints includes techniques for painting exteriors and interiors described according to costs and house plans.

National Lead Company. *Artistic Interiors for Homes*. New York, NY: 1890.*

This illustrated guide addresses color schemes for each room in the home; it provides hints for colors for bedrooms, living rooms, and kitchens. Color plates are included.

National Lead Company. *Artistic Interiors for Homes*. New York, NY: 1909.*

This illustrated guide describes the decoration of the interior of homes in the Victorian age. Although the emphasis is on paint, the images are detailed accounts of the aesthetic preferences related to furniture and other decorative features of the period.

National Lead Company. *Correct Color Schemes Illustrated*. New York, NY: 1910.*

This illustrated guide stresses painting the home so that it is in harmony with architecture and its setting. Color plates are included. This is a good source for understanding the aesthetic preferences of architectural decoration in the early 20th century.

Noyes Brothers and Cutler. *Noyes Brothers and Cutler*. St. Paul, MN: 1888.**

This illustrated catalog of brushes, oils, varnishes, and paints includes price lists.

Pierce, F. O., and Company. *F. O. Pierce and Company Catalog*. New York, NY: 1884.**

This illustrated catalog of paints and varnishes for the architect also discusses practical uses of paints appropriate for the architecture of the period.

Rice, A. L. *Powdrpaint: A Remarkable Discovery*. Adams, NY: 1901.*

Powdrpaint was a discovery which claimed to reduce the cost of painting in the early

twentieth-century. It was a mixture of durable paint pigments with cement and water-proof compounds. Color plates are included in the pamphlet along with price lists and shipping information.

Richardson, B. J. *Endorsements of B. J. Richardson's*. Boston, MA: 1888.*

This advertising pamphlet supports Richardson's varnish products. Costs and descriptions of varieties are followed by consumer testimonials.

Sears, Roebuck and Company. *Seroco Paints*. Chicago, IL: 1908.*

This illustrated price guide includes color plate samples of paints, varnishes, brushes, and wallpaper. It also includes a section on popular stencil styles and techniques of the period.

Seeley Brothers. *Seeley Brothers Catalog*. New York, NY: 1889.*

Seeley Brothers, manufacturer of "Averill" paints, provides in this pamphlet directions through an illustrated guide to painting trim, roof, and body of different architectural styles. This pamphlet is revealing of historical decorative styles.

Senour, Martin C. *The Home Beautiful*. Chicago, IL: 1910.*

This illustrated guide provides hints regarding creation of a harmonious home with Martin Senour color paints. This pamphlet focuses on the use of paint as an interior decoration tool.

Sherwin-Williams Company. *Color Schemes for Exterior House Painting*. Cleveland, OH: 1910.*

This illustrated guide recommends exterior and interior paint and varnish schemes for the home, depending on its architectural style.

_____. *Helpful Hints for the Decoration and Upkeep of the Home*. Cleveland, OH: 1910.*

This informative guide covers paint selection, brightening finishes, and stenciling in the early twentieth century. It also includes a bibliography of all of the booklets Sherwin-Williams produced to aid in the painting the bungalow and farmhouse on a room-by-room basis.

_____. *The Ideal Plan of Home Decoration*. Cleveland, OH: 1910.*

This guide from the decorative department of Sherwin-Williams addresses decorating each room of the home with paint. Emphasis is on interior decoration, but exteriors are also mentioned. There is also a bibliography of Sherwin-Williams booklets produced to help with home decoration.

_____. *Sherwin-Williams Catalog*. Cleveland, OH: 1910.*

This card price list provides a color chart of prepared paint and varnishes.

_____. *Sherwin-Williams Company Woodcraft-Stains*. Cleveland, OH: 1910.*

These descriptions and color plates of stains available from Sherwin-Williams in the early twentieth century can be informative in dating stains if available for color view.

Sherwin-Williams Company. *Style Portfolio of Home Decoration*. Cleveland, OH: 1910.*

This source includes suggestions for the interior, exterior and decorative details accomplished with paint. It provides an illustrated guide to decorating each room of the home.

Shoemaker, Robert, and Company. *Robert Shoemaker and Company Catalog*. Philadelphia, PA: 1867.**

This illustrated catalog of brushes, paints, oils and varnishes contains a complete price listing of all painting supplies produced by Shoemaker.

Tiemann, D. F., and Company. *D. F. Tiemann and Company Catalog*. New York, NY: 1858.**

This catalog describes dry and ground colors and includes pictorial wrappers from paint cans.

Wadsworth, Howland, and Company. *Bay State Liquid Paints and Varnishes*. Boston, MA: 1915.*

This advertising pamphlet advocates pre-mixed Bay State paint products. It emphasizes New England architectural styles of the early-twentieth century.

Wadsworth, Martinez, and Longman. *Specimens of House Painting*. New York, NY: 1882.*

This illustrated source provides examples of painting houses in shades most flattering to the Victorian home.

_____. *Wadsworth, Martinez, and Longman*. Brooklyn, NY: 1882.**

This sources includes illustrations of homes and buildings in various combinations of color paint schemes along with a price list.

Wetherill, George D. *Atlas Ready-Mixed Paint*. Philadelphia, PA: 1910.*

This price list with color plates advertises Atlas ready-mixed paints.

Ziegler and Smith. *Ziegler and Smith Catalog*. Philadelphia, PA: 1872.**

This catalog of supplies includes white lead, zinc, and color paints for use with homes and other facilities.

Modern Works on Historic Paint

Modern scholars have researched the historic use of paint and have published many articles and books which remain available at public or university libraries with substantial collections. These resources range from general studies of materials and techniques to very specific studies which focus on particular topics. They also vary from general to specific coverage in terms of time periods or geographic areas. Although some of these studies depend on information derived at least partly from modern scientific analysis, the emphasis here falls on the historic information itself rather than on the analytic technique employed. (A later section of the bibliography addresses historic paint analysis.)

Bristow, Ian. "Two Exterior Treatments to Imitate Stone During the Eighteenth and Nineteenth Centuries." *Transactions of the Association for Studies in the Conservation of Historic Buildings*. Vol. 4 (1979), pp. 3-6.

"Sanding" was a common protective coating used in England during the eighteenth and early-nineteenth centuries. It involves sprinkling sand on oiled masonry. A 19th century finish, "fresco", is made of roman cement stained with ferrous sulfate. The article includes a discussion of literature and catalogs.

Candee, Richard M. *House Paints in Colonial America*. New York, NY: Chromatic Publishing Co.: 1967.

Candee's M. A. thesis of the same title is reprinted in this special volume. See below for a complete annotation.

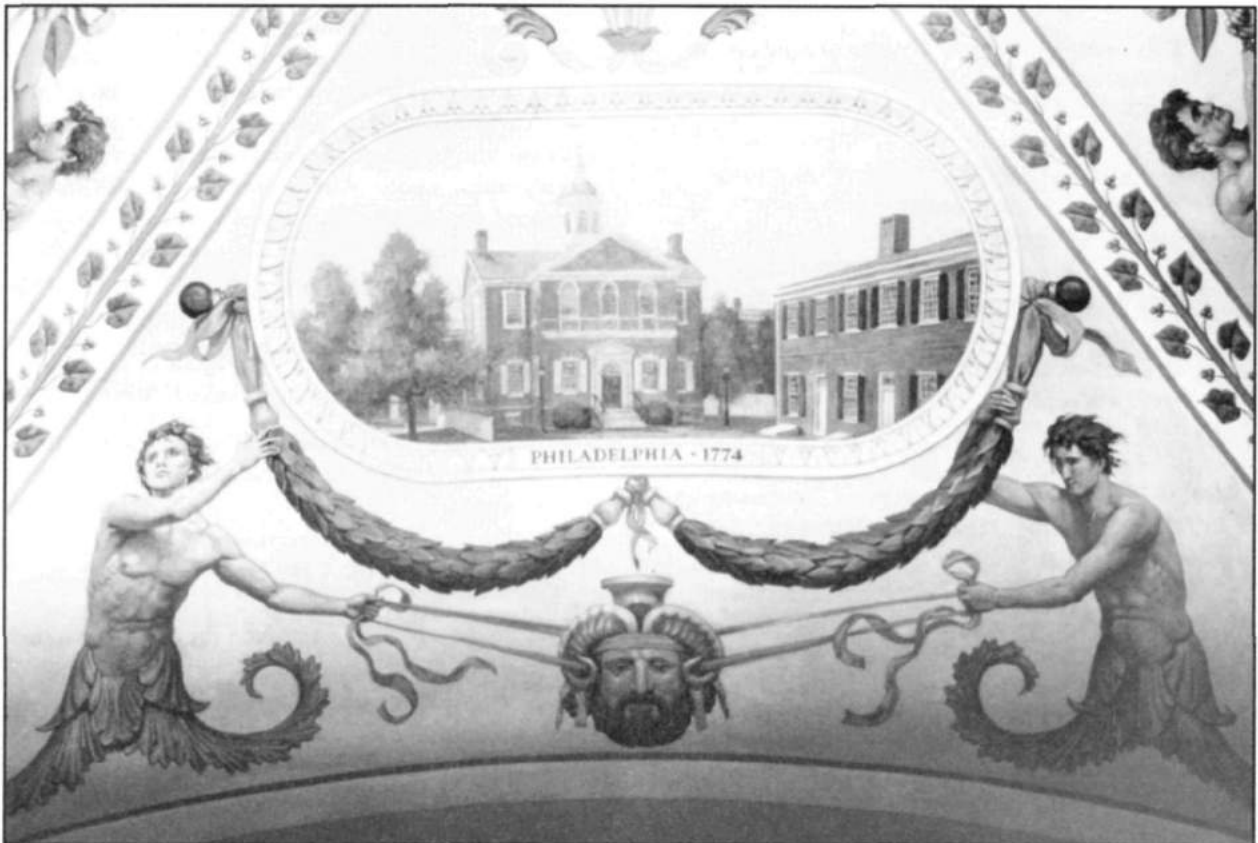
_____. "House Paints in Colonial America, Their Materials, Manufacture, and Application: Part I." *Color Engineering*. Vol. 4, No. 5 (1966), pp. 26-29.

These three articles are based on Candee's master's thesis. This first article describes the

development of the American paint industry. Pigments availability, equipment, and manufacturing processes are described.

_____. "House Paints in Colonial America, Their Materials, Manufacture, and Application: Part II." *Color Engineering*. Vol. 4, No. 5 (1966) pp. 29, 32-24 and Vol. 4, No. 6 (1966) pp. 24-26, 30.

This second article describes types of exterior paints used during the 18th century included oil paints for wood and cement paints for roofs. Typical colors and finishes are described, such as oil-based paints, whitewash, and distemper paints.



Ceiling painting in Carpenter's Hall, U.S. Capitol, House Wing, Washington, D.C. Photo: David W. Look, AIA.

_____. "House Paints in Colonial America, Their Materials, Manufacture, and Application: Part III." *Color Engineering*. Vol. 5, No. 1 (1967) pp. 37-43 and Vol. 5, No. 2 (1967) pp. 32-42.

This last article in the series discusses the sources and manufacturing processes of black, white, green, red, blue, and yellow pigments.

_____. *Materials Toward a History of Housepaints: Materials and Crafts of the Housepainter in Eighteenth Century America*. Master's thesis. Cooperstown, NY: State University of New York, College at Oneonta, Cooperstown Graduate Program, 1965.

Candee's thesis documents early American house painting. His thesis has been published in three articles in *Color Engineering* and by Chromatic Publishing Company, New York, in 1967.

_____. "Rediscovery of Milk-based House Paints and the Myth of 'Brickdust and Buttermilk' Paints." *Old Time New England*. Vol. 58, No. 3 (January 1968), pp. 79-81.

Candee examines the common myth that eighteenth-century colonists used a paint combination of "brickdust and buttermilk". Since both formulas were used in the U.S., it is not impossible that they could have been mixed. Based on his evidence, Candee discounts the existence of such a paint and suggests that our ancestors may have misread early nineteenth-century receipts.

"Downing on Color." *Old House Journal*. Vol. II, No. 10 (October 1974), p. 11.

This short article is a summary of Downing's color theories from *The Architecture of Country Houses*. It contains a few of Downing's ideas concerning interior and exterior house colors and a list of approved colors.

Downs, Arthur Channing, Jr. "The Introduction of American Zinc Paints, ca. 1850." *Association for Preservation Technology Bulletin*. Vol. VI, No. 2 (1974), pp. 36-37.

This brief article contains extracts from 1851 *Transactions of American Industry* in New York City. It shows when zinc paints began to be used and in what colors. A more complete history of zinc paints by Downs can be found in the *APT Bulletin* (see the following entry).

_____. "Zinc for Paint and Architectural Use in the 19th century." *Association for Preservation Technology Bulletin*. Vol. VIII, No. 4 (1976), pp. 80-99.

This article contains a history of zinc paint and its uses for galvanizing and paint in Europe and the U.S. It also includes a summary of important dates, a chronological listing of U.S. zinc patents from 1831 to 1862 with selected patents issued from 1863-1873, and a list of principal paint colors from the September 1849 issue of *The Builder*, published in London.

Flaherty, Carolyn. "Late 19th Century Decoration." *Old House Journal*. Vol. V, No. 7 (July 1977), pp. 73, 76-78.

Although this article covers a range of subjects relating to late 19th century interior decoration, a short section discusses the effects of color on walls and ceiling, based on guidelines created by the Victorian designer Henry Hudson Holly.

Green, Teresa Osterman. *The Birth of the Paint Industry*. Master's thesis. University of Delaware, June 1975.

Green's thesis documents the history of the paint industry in the United States from the latter part of the 19th century to the first decade of the 20th century. Technical analysis of paint makeup is excluded.

Hawkes, Pamela. "Economical Painting: The Tools and Techniques Used in Exterior Painting in the 19th Century." *The Technology of Historic American Buildings: Studies of the Materials, Craft Processes, and the Mechanization of Building Construction*. Edited by H. Ward Jandl. Washington, DC: The Foundation for Preservation Technology, 1983.

This essay focuses on how paints were used to protect exterior materials and methods for achieving decorative and protective finishes. Topics include the following: painter's tools, resources, and materials; paint for woodwork, metal, brick, stone, and stucco; decorative treatments of sanding, marbling, and graining; and re-painting.

_____. "Paints for Architectural Cast Iron." *Association for Preservation Technology Bulletin*. Vol. XI, No. 1 (1979), pp. 17-36.

Hawkes provides a brief history of paints used for protecting cast iron, beginning with the ancient classical civilizations and continuing to the present. She then reports the results of an analysis of the paints used on thirteen cast iron facades in Manhattan.

Little, Nina Fletcher. *American Decorative Wall Painting, 1700-1850*. New York, NY: Dutton, 1972 (Originally published in 1952).

This definitive book on the architectural use of paint in New England is divided into two parts; Part 1 focuses on painted woodwork while Part 2 focuses on painted plaster walls. Little discusses overmantel landscapes, chimney boards, painted floors, stencilled walls, and scenic panoramas. The appendices include biographical listings of painters, a list of pictorial panels, an extensive bibliography, and numerous illustrations

Loth, Calder. "A Mid-Nineteenth Century Color Scheme." *Association for Preservation Technology Bulletin*. Vol. IX, No. 2 (1977), pp. 83-88.

This case study describes the original paint scheme for "Woodside" built in 1858 near Richmond, Virginia. Many buffs and browns are used which follow Downing's recommendations in *The Architecture of Country Houses*, 1850. Other decorative painting treatments include grained and scored stucco to resemble sandstone ashlar, oak graining on doors, and marbleizing on baseboards. A transcription of the 1858 instructions for these treatments is included.

McClauthery, Martha Crabill. "Household Art: Creating the Artistic Home, 1868-1893." *Winterthur Portfolio*. Vol. 18, No. 1 (Spring 1983), pp. 1-26.

Although this article covers the decoration of furniture for the most part, it also covers, in detail, painting styles for the interior of homes of this period. For example, designs for mantelpieces, floors, and walls give insight to the paint styles of the nineteenth century.

McGrath, Robert L. *Early Vermont Wall Paintings, 1790-1850*. Hanover, NH: The University Press of New England, 1972.

The wide spread practice of wall painting in New England, particularly Vermont, is explored in more detail in this book. Like the wall frescoes of Pompeii, early settlers used art to "ape the style and accouterments of more patrician ways of life."

Moss, Roger W. *Century of Color: Exterior Decoration for American Buildings, 1820-1920*. Watkins Glen, NY: American Life Foundation, 1981.

Moss documents American exterior paint colors with 100 plates from the Athenaeum

collection in Philadelphia and the Sherwin-Williams Company archives. They can be used along with "Heritage Colors" line by the Sherwin-Williams Company.

"Painting Advice from The Craftsman." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 186-189.

This article summarizes some of Gustav Stickley's painting philosophy for the exterior and interior, specifically the living room and hallway, dining room, kitchen and bath, and bedrooms.

Penn, Theodore Z. *Decorative and Protective Finishes, 1750-1850, Materials, Process and Craft*. Master's thesis. Newark, DE: University of Delaware, 1966.

This thesis is a fine documentary history of early house painting in the United States. See below for complete annotation.

_____. "Decorative and Protective Finishes, 1750-1850, Materials, Process and Craft." *Association for Preservation Technology Bulletin*. Vol. XVI, No. 1 (1984), pp. 3-45.

This lengthy and comprehensive article is Penn's master's thesis for the degree of Master of Arts in History at the University of Delaware. The purpose of the thesis is to illustrate the level of paint technology from 1750-1850 by examining how finishes were made, materials used to make them, and application methods. Part I includes the following four categories of finishing materials: dyestuffs and lake pigments; natural and synthetic pigments; balsams, gums, and resins; and binders, solvents, and thinners. Each listing explains the material's properties and uses and gives important historical data. Part II describes how materials were processed to form the decorative and protective finish: pigmented finishes, resin finishes, and tinted resin finishes. The listings include information on manufacturing methods

and application methods. Extensive footnotes, a bibliography, and 8 color illustrations are given.

Peterson, Charles E. "Early Sanded Paint Finish." *Journal of the Society of Architectural Historians*. Vol. IX, No. 3 (October 1950), pp. 23-24.

In this short article, several sources documenting sanded finishes are mentioned. In the eighteenth century, sand was mixed with paint to resemble stone. The author suggests that this practice may have been more common than is generally believed.

Seale, William. *Recreating the Historic House Interior*. Nashville, TN: American Association for State and Local History, 1979.

Interior paint finishes are briefly mentioned on pages 29-30. Seale discusses painting practices of the 1800s and the problems involved in accurate reproduction.

Welsh, Frank Sagendorph. "Architectural Metallic Finishes in the Late 19th and Early 20th Centuries. The Great Imitators: Aluminum and Bronze." *The Interiors Handbook For Historic Buildings*. Washington, DC: Historic Preservation Education Foundation, 1988.

This paper written for the 1988 Interiors Conference for Historic Buildings examines the historical usage and application of non-precious metallic decorative finishes. Included are historic techniques for bronze painting, powder bronzing and leafing. A list of buildings where metallic finishes were used is also included.

_____. "The Art of Painted Graining." *Historic Preservation*. Vol. 29, No. 3 (July/September 1977), pp. 32-37.

This is an informative article on the techniques of using paints to imitate the grain,

knotting, and color of wood. Welsh gives a history of graining and describes its use in several historic buildings.

Welsh, Frank. "18th Century Black Window Glazing in Philadelphia." *Association for Preservation Technology Bulletin*. Vol. XII, No. 2 (1980), pp. 122-123.

Welsh describes the uncommon practice of using black putty and white paint on mullions, possibly to make the mullions look slimmer and the window lights larger.

_____. "Report on an Early Wall Stencil in Philadelphia." *Association for Preservation Technology Bulletin*. Vol. V, No. 2 (1973), pp. 54-62.

Welsh describes the ca. 1810 wall stencil designs and the craftsman's process. He has included line drawings of the stencils and keyed them to the Munsell Color Notation system.

Whiffen, Marcus. *Eighteenth-Century Houses of Williamsburg; A Study of Architecture and Building in the Colonial Capital of Virginia*. New York, NY: Holt, Rinehart, and Winston, 1960.

Paint colors were a desirable import to Colonial Williamsburg. Whiffen discusses common painting practices and gives excerpts from period documents. In regard to interior paint colors, Whiffen makes two generalizations. First, white and cream were hardly ever used. Second, the bold, full colors did not produce a glare, probably due to the addition of the ingredient lampblack.

Winkler, Gail Caskey, and Roger W. Moss. *Victorian Interior Decoration, American Interiors 1830-1900*. New York, NY: Henry Holt and Company, 1986.

This book contains information on the qualities of distemper, latex, oil, and white

paint and how they were made. Particularly useful are the descriptions of color schemes by room. There is also a section on paint technology and color theory from 1870-1890.

Analyzing Historic Paint

Buildings usually acquire numerous paint schemes during their existence. Typically, evidence of these changes survive as a succession of very thin paint layers on the various painted surfaces of the building. These layers constitute a stratigraphy, with the oldest layers lying near the substrate and the youngest exposed to the view of today's visitor. By examining cross-sections of these layers through a microscope, subjecting them to microchemical testing, and employing a variety of advanced analytical techniques, the historic paint analyst can often determine the chromochronology, or paint history, of a specific element, a room, or an entire building. This information enables the preservationist to select a color scheme that reflects the actual historical paint treatment associated with the period of interest. Sometimes the same information can be used to determine the relative dating of various building components.

Introducing Paint Analysis

The entries within this section describe the historic paint analytical process from the layman's point of view. Most of these works explain the analytical process and suggest basic steps which a layman might successfully employ (the authors themselves are mostly accomplished professional analysts). In addition, a few articles describe the work of professional analysts, but in a non-technical format, and so are included in this introductory section.

Judd, Henry A. "Before Restoration Begins: Keeping Your Historic House Intact." *Technical Leaflet 67, History News*. Vol. 28, No. 10. Nashville, TN: American Association for State and Local History, October 1973.

In a section of this leaflet, Judd stresses the importance of recording old paint layers by matching them to the Munsell Color System and actually saving samples for the restorationist to use.

_____. "Before Restoration Starts." *Association for Preservation Technology Bulletin*. Vol. III, No. 1 (1971), pp. 30-37.

In this discussion of restoration dos and don'ts, Judd recommends recording paint layers with the Munsell Color System and saving samples for the restorationists. He mentions Lee's home, Arlington, where maintenance workers incorrectly painted the shutters a green color and Andrew Johnson's home where paint analysis was used as a dating tool for the stairs.

Kirk, John T. *The Impecunious House Restorer*. New York, NY: Alfred A. Knopf, 1984.

This book describes an analysis of the paint uncovered during a restoration project. Repainting is done to match original colors. There is a discussion on the best areas and ways to do a paint analysis along with problems to consider.

Lambert, E. "Ian Bristow uncovers the Past." *Architectural Digest*. Vol. 43, No. 4 (April 1986), pp. 230, 232, and 234.

Ian Bristow is a London architect and an expert on historic paints. Through microscopic analysis Bristow determines original paint colors which are often very different from what we might expect them to be. This article briefly discusses Bristow's investigative methods.

McCabe, Carol. "Discovering Old Paint Colors." *Early American Life*. Vol. XII, No. 3 (June 1981), pp. 24-27.

This article describes the paint analysis work of Sara Chase, consultant for the Society for the Preservation of New England Antiquities, SPNEA. Most of the article focuses on how paint analysis can prove that 18th and early 19th century houses were painted very colorfully.

Mosca, Matthew. "Historic Paint Research: Determining the Original Colors." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 81-83.

Mosca begins by explaining the problems inherent to analysis of historic paint (unstable pigments, yellowing of linseed oil). He then discusses the process of paint research involving sampling, testing, microscopic evaluation, color matching, paint seriation charts. He recommends and explains simplified techniques for the homeowner regarding sampling and interpretation.

Welsh, Frank S. "Paint and Color Restoration." *Old House Journal*. Vol. III, No. 8 (August 1975), pp. 1, 8-11.

This article, aimed at the layman, discusses common eighteenth and nineteenth-century painting materials, methodology of paint research, information on how to sample and interpret paint samples, and re-painting. It also contains a case history of a paint study.

Analyzing on A Basic Professional Level

This section focuses on the basic analytical techniques employed by the professional paint analyst, including normal and polarized light microscopy, elementary microchemical testing, color matching using the Munsell color system, etc. Some entries discuss analytical techniques in a comprehensive fashion, while other focus on a specific analytical technique. A few entries deal with paint analysis as a profession, discussing existing laboratory facilities, training and accreditation, etc. The reader is cautioned that inclusion of an entry does not necessarily indicate acceptance of a proposed technique by the professional community.

Batcheler, Penelope Hartshorne. "Commentary." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16, 1972. Washington, DC: The Preservation Press, 1976, pp. 300-303.

Batcheler addresses the need for a handbook on paint research to be used by restoration architects and conservation scientists. She lists many points to be covered such as research methods, paint components, color interpretation, methods for matching and mixing paint, current paints, and paint maintenance.

_____. "Paint Color Research and Restoration." *Technical Leaflet 15, History News*. Vol. 23, No. 10 Nashville, TN: American Association for State and Local History, October 1968.

Batcheler describes paint dating, mediums, removal, and matching for historic buildings. Her article is a good, simple guide for those interested in doing a preliminary paint analysis.

Bristow, Ian. "Repainting Eighteenth-Century Interiors." *Transactions of the Association for Studies in the Conservation of Historic Buildings*. Vol. 6 (1981), pp. 25-33.

Bristow, a London architect, examines the colors used in eighteenth-century English interiors by discussing several case studies. He addresses the problems related to unreliable sampling and readings of cross-sections and gives guidelines for redecoration.

"Discussion." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16, 1972. Washington, DC: The Preservation Press, 1976, pp. 306-309.

These are comments made by the panelists and audience during the conference. They noted

many of the philosophical questions as well as the problems related to analysis and reproduction. Are precise color matches really necessary? They require great amounts of time and are costly. Furthermore, vehicles, pigments, and techniques are often very difficult to analyze accurately.

Doonan, Nancy Locke. "Historic Exterior Paints: Guidelines for Establishing Whether a Sample Contains a Layer Original to the Building's Construction." *Association for Preservation Technology Bulletin*. Vol. XIV, No. 2 (1982) pp. 26-29.

The author lists many considerations for deciding whether a sample contains an original layer. She uses tables and mathematical formulas to calculate the number of years per layer. This methodology is not generally accepted by most paint analysts.

Ferro, Maximillian L. "New Directions in Architectural Conservation: The Role of Physical Evidence." *Technology and Conservation*. (Spring 1976), pp. 14-17.

This article mentions many of the ways in which physical evidence is used to study a building's history. Ferro briefly describes the process of paint analysis in which paint is sampled, its layers are analyzed, and it is then compared to other samples within the room to gain a history of repainting.

Matero, Frank G., and Joel C. Snodgrass. "Understanding Regional Painting Traditions: The New Orleans Exterior Finishes Study." *Association for Preservation Technology Bulletin*. Vol. XXIV, Nos. 1 and 2 (1992), pp. 36-52.

The authors developed a program of architectural research to explore the painting practices of New Orleans with the goal of creating a historic exterior paint palette. Samples were extracted from exterior facades representing stylistic variations of five traditional building types. The analytical techniques included microscopic examination

of cross-sections for color matching using the Munsell system, and pigment identification of selected samples using normal and polarized light and microchemical tests. Based on this analysis, exterior paint palettes were created for the various types of buildings. This article is illustrated with numerous black and white as well as color photographs and includes microphotographs of selected paint samples. Also included are color photographs of the resulting paint palettes.

Miller, Kevin H., editor. *Paint Color Research and Restoration of Historic Paint*. Ottawa, Canada: Association for Preservation Technology Supplement, 1977.

This supplement is a compilation of five past articles on the methodology for exposing and preserving architectural graining, restoration of paint colors at the Harrison Gray Otis House, experimental paint color research with solvents, and notes on paint research and reproduction.

Palenik, Skip. "The Polarizing Microscope, A Valuable Analytical Instrument In Conservation." *Technology and Conservation*. (June 1977), pp. 28-33.

The polarizing microscope works essentially as a conventional compound microscope with certain modifications which allow a material's optical qualities to become apparent. The polarizing microscope can provide important clues to sample identification. Palenik discusses how pigments, media, corrosion products, fibers, paper, minerals, stone, masonry, metals, and alloys can be examined.

Perrault, Carole L. "Techniques Employed at the North Atlantic Historic Preservation Center for the Sampling and Analysis of Historic Architectural Paints and Finishes." *Association for Preservation Technology Bulletin*. Vol. X, No. 2 (1978), pp. 6-46.

This article details the paint research methodology used at the North Atlantic Historic Preservation Center. It includes

information on sampling, sample preparation, analysis, report preparation, sample storage, a list of needed equipment, and several sample data sheets.

Phillips, Morgan W. "Brief Notes On the Subjects of Analyzing Paints and Mortars and the Recording of Moulding Profiles." *Association for Preservation Technology Bulletin*. Vol. X, No. 2 (1978), pp. 77-89.

A short section of this article describes the difficulties of analyzing paints and mortars, specifically looking at the inaccuracies with color description. The majority of the article is devoted to mortars and moulding profiles.

_____. "Problems in the Restoration and Preservation of Old House Paints." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16, 1972. Washington, DC: The Preservation Press, 1976, pp. 273-285.

Phillips, formerly Architectural Conservator for the Society for the Preservation of New England Antiquities (SPNEA), is a pioneer in the field of paint analysis. This paper examines the problems involved in preserving and restoring oil-based paints in early American homes. Much of Phillips' work is based on his restoration of the original paint colors at the first Harrison Gray Otis House in Boston, Mass, 1795-96. Phillips covers the problems of discoloration, texture, other appearance features, and glazes and verdigris. He discusses the preservation problems of adhesion, reattachment and inpainting, protecting from light damage, and protection with varnish.

Phillips, Morgan W., and Norman R. Weiss. "Some Notes on Paint Research and Reproduction." *Association for Preservation Technology Bulletin*. Vol. VII, No. 4 (1975), pp. 14-16.

This article contains information on various topics related to paint research such as surface

polishing of paint samples, counting paint layers, making a whitewash binder, and making sanded paints.

Schur, Susan E. "Conservation Training Profile: the National Trust Restoration Workshop." *Technology and Conservation*. Vol. 5, No. 2 (Summer 1980), pp. 36-39.

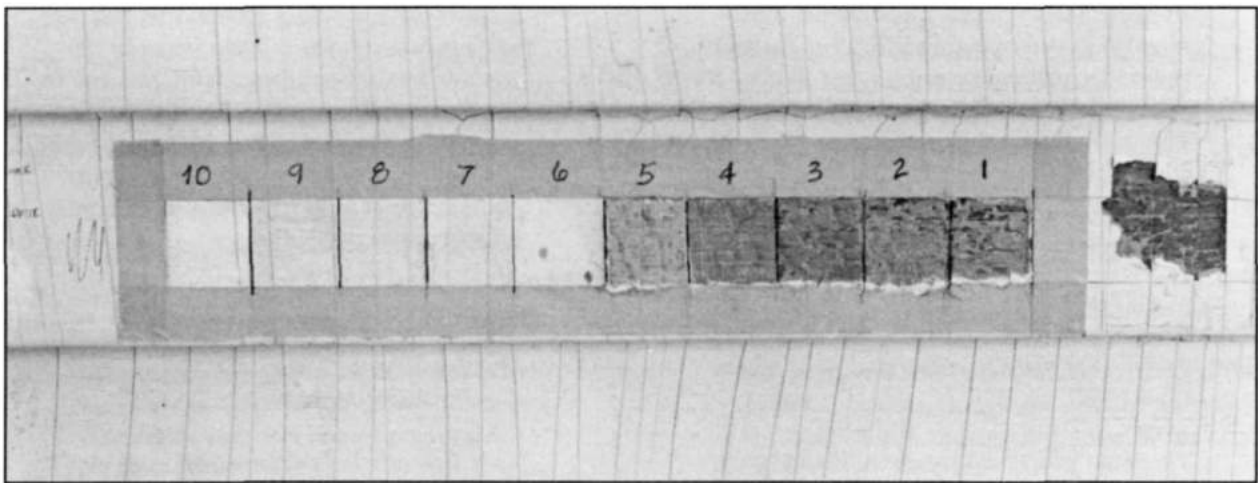
Paint analysis is just one of the many techniques taught in this apprenticeship program which combines classroom and on-site work.

_____. "Laboratory Profile: The National Park Service's North Atlantic Region Preservation Laboratory." *Technology and Conservation*. Vol. 1, No. 2 (Fall 1976), pp. 18-19, 23, and 28.

Schur discusses the creation of the North Atlantic Region Preservation Laboratory. The article includes descriptions of three areas of specialization: paint analyses, mortar studies, and x-ray techniques. It also describes the development of a reference system.

Standard Operating Procedures for the Analysis of Historic Building Materials at the Building Conservation Branch. Cultural Resources Center, North Atlantic Region, National Park Service, 1991.

Section II describes the procedures used in sample identification and documentation. Specific instructions are given regarding sample location, quantity, size, and record keeping. Section IV describes sampling, identification of layers, mounting, identification of pigment and medium, color matching, and storage of samples and data. The appendices to this section include stratigraphy sheets, and information on microchemical testing and ultra-violet light exposure. Section VIII gives instructions on photomicroscopy.



Historic paint analysis carried out on horizontal wood siding. Each layer removed can be matched to a color in the Munsell Color System.
 Photo: D.F. Minnery.

Welsh, Frank S. "Paint Analysis." *Association for Preservation Technology Bulletin*. Vol. XIV, No. 4 (1982), pp. 29-30.

This brief article discusses the steps and considerations of paint analysis using microscopic, chemical, and bleaching techniques to determine the nature and color of historic paints.

_____. "Who Is An Historic Paint Analyst? A Call for Standards." *Association for Preservation Technology Bulletin*. Vol. XVIII, No. 4 (1986), pp. 4-5.

Welsh begins by presenting examples of articles published in *APT Bulletin* that contain misleading or erroneous information, which he contends displays an obvious lack of professional expertise among some of those who profess to be "paint analysts". He argues for the clarification of the meaning of the term "paint analysis" and proposes the creation of professional standards for paint analysis work. Minimal standards would include the following: knowledge and skills with stereo and polarized light microscopy and microchemical testing; comprehension of architectural history and technology; knowledge of historic finish manufacture and

application technology; understanding and perception of color and the effects of aging on paint colors; and willingness and ability to evaluate findings and techniques. He identifies APT and AIC as the appropriate organizations to pursue this topic.

Applying Advanced Analytical Techniques

The following entries address advanced analytical techniques which can be used to supplement basic procedures. Some of the articles reflect the experimental nature of the authors' work, which is often undertaken to develop and test a proposed new technique.

Albee, Peggy A. "A Study of Historic Paint Colors and the Effects of the Environmental Exposures on Their Colors and Their Pigments." *Association for Preservation Technology Bulletin*. Vol. XVI, Nos. 3 and 4 (1984), pp. 3-25.

This article contains the results of a study conducted to identify historic paint colors

from original recipes. These paints were sampled to determine the effects of darkness caused by subsequent paint layers, fading due to ultraviolet light, and exterior weathering. The thirty-three colors sampled and the changes are documented with Munsell Color notations and spectrophotometric readings.

_____. "Technology Trends: Hue & Pry...to determine an historic property's true colors." *Technology and Conservation*. Vol. 7, No. 3 (Fall 1982), pp. 5-8.

This brief article discusses the limited paint experiment of historic paint recipes conducted by the North Atlantic Preservation Center. Albee's article in *APT Bulletin* (see above) discusses the study and its results in more detail. The study is followed by a case study of Central Wharf Warehouse in which the mid-1800s paint colors were determined.

Barr, James K. "Commentary." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16, 1972. Washington, DC: The Preservation Press, 1976, pp. 304-306.

Barr believes that painted surfaces in historic buildings are not accurate in color or glossiness. He proposes a four-step process for more accurately reproducing historic paint colors. First determine the pigments through scientific analyses. Second, reproduce a small amount of paint. Next, test the sample with a spectrophotometric reflectance curve. Finally, send the reflectance curve to a paint manufacturer for accurate matching with modern paints.

Brommelle, Norman. "Colour and Conservation." *Studies in Conservation*. Vol. 2, No. 2 (October 1955), pp. 76-85.

In this paper Brommelle summarizes the use of color science in conservation. Topics

include the following: the description of surface colours, the relation between the spectrum and the colors of surfaces, the use of instruments to measure color, the estimation of color differences, the influence of surface texture on color estimation, the colors of complex paint layers, and the matching of retouching in restoration.

de la Rie, E. Rene. "Fluorescence of Paint and Varnish Layers: Part I." *Studies in Conservation*. Vol. 27, No. 1 (1982), pp. 1-7.

This first article in a three part series on the fluorescence of painting materials under fluorescent light focuses on measuring pigment fluorescence with a fluorescence spectrometer. The study found that zinc white, cadmium pigments, and genuine madder were the most fluorescent. Both the physico-chemical nature of fluorescence and the fluorescence of pigments are discussed.

_____. "Fluorescence of Paint and Varnish Layers: Part II." *Studies in Conservation*. Vol. 27, No. 2 (1982), pp. 65-69.

This second article deals with the fluorescence of linseed oil films and natural resin films studied with a fluorescence spectrometer. These materials fluoresce after some degradation. The fluorescence appears to be related to yellowing.

_____. "Fluorescence of Paint and Varnish Layers: Part III." *Studies in Conservation*. Vol. 27, No. 3 (1982), pp. 102-108.

This final article discusses the fluorescence of oil-paints and picture surfaces studied with a fluorescence spectrometer. The presence of pigments influences the fluorescence and the yellowing of linseed oil.

Feller, Robert L. "The Deterioration of Organic Substances and the Analysis of Paints and Varnishes." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16. 1972. Washington, DC: The Preservation Press, 1976, pp. 287-299.

Dr. Feller is a chemist and an expert in paint analysis. In this article he describes how autoxidation, behavior, and induction times relate to the deterioration of paints and varnishes through both written descriptions and graphs. For example, low temperature and low light levels slow deterioration. However, much more investigation into the chemistry and physical principles of paint and its deterioration is necessary. Paint and varnish samples are analyzed by examining the pigments, color, and vehicles.

_____. "Scientific examination of artistic and decorative colorants." *Journal of Paint Technology*. Vol. 44, No. 566 (March 1972), pp. 51-58.

Feller begins with a brief history of commercial paint manufacture in the U.S. beginning in the early nineteenth century. Records of early paint industries are becoming harder to find, making "dating pigments" more difficult. One example, lead white, used in artist's paintings, is now being used as a dating pigment. New analytical methods can differentiate between different manufacturing methods at various times for old standby pigments as well as the new industrial pigments.

Milley, John. "Experimental Paint Color Research With Solvents at Independence National Historical Park, Philadelphia." *Association for Preservation Technology Newsletter*. Vol. 1, No. 2 (August 1969), pp. 19-20.

This short article provides an alternative to the scalpel and microscope method of paint

analysis, the use of chemical solvents. With this method, large areas of paint at any level can be removed. However, care should be taken since these solvents are flammable.

Plesters, Joyce. "Cross-sections and chemical analysis of paint samples." *Studies in Conservation*. Vol. 2, No. 3 (April 1956), pp. 110-57.

The author describes the paint sample mounting and analytical techniques used at the National Gallery laboratory. Although written for the fine arts conservator, some of the methods also have applicability to the analysis of paints used in buildings. Plesters provides a table which lists tests for pigments, including both simple chemical reagents and organic "spot-test" reagents. She also describes the identification of paint media through chemical tests.

Considering the Nature of Paint

The last section related to paint analysis lists works which focus primarily on the chemical and physical nature of paint. Many of the entries are drawn from the professional literature of art conservation, since this field has developed much faster than architectural conservation; these are relevant to both fields because many of the same pigments and media were used in protective and decorative painting of buildings as well as in fine art paintings.

Doerner, Max. *The Materials of the Artist and their Use in Painting, with Notes on the Techniques of the Old Masters*. Translated by Eugen Neuhaus. New York, NY: Harcourt, Brace, 1949 (Originally published in 1934).

Doerner examines the painting techniques of the old masters by studying old pictures, documentary evidence, and imitative methods. Chapters are devoted to the preparation of grounds, pigments, binding media, painting in oils, tempera painting, pastel painting, water color painting, mural painting, old master techniques, and restoring easel pictures.

Faloon, Dalton B. *Zinc Oxide: History, Manufacture and Properties as a Pigment*. New York, NY: D. Van Nostrand Company, 1925.

This book gives a brief history of zinc, followed by a description of manufacturer's processes, specifications, and methods of examination. It was originally written as a metallurgical engineer's book for the furnace designer and operator.

Feller, Robert L., ed. *Artists' Pigments: A Handbook of their History and Characteristics*. Washington, DC: National Gallery of Art, 1986.

Dr. Feller is a chemist and an expert in paint analysis. This handbook is a compilation of articles covering the history and scientific analysis of ten pigments. It includes charts, tables, diagrams, and photographs. At the end of each article are references and indexes. Although intended for fine art historians and artists, this handbook could be useful for those interested in the architectural use of paints.

_____, Nathan Stolow and Elizabeth H. Jones. *On Picture Varnishes and Their Solvents*. Cleveland, OH: The Press of Case Western Reserve University, 1971 (Originally published by the Intermuseum Conservation Association in 1959).

This book is a collection of papers presented at a Seminar on Resinous Surface Coatings hosted by Intermuseum Conservation Association, Oberlin, Ohio. Chapters are devoted to solvents, solvent action, resins and the properties of varnishes, and varnish removal. These papers on varnish and solvent technology demonstrate the relationship between chemistry and art conservation.

Fischer, William von, ed. *Paint and Varnish Technology*. New York, NY: Reinhold Publishing Corporation, 1950 (second edition).

This book describes many aspects of the protective coatings industry such as pigments,

exterior and interior trade sales paints, application methods. Its focus is on the chemical properties and testing of these coatings. Many paint company chemists served as contributing authors. Some of the chapters include helpful references.

Gardner, Henry Alfred, and George G. Sward. *Physical and Chemical Examinations of Paints, Varnishes, Lacquers and Colors*. Washington, DC: Institute of Paint and Varnish Research, 1946.

This book was written for chemists, chemical engineers, paint technicians, and others involved in the organic coatings industry. The reference work covers test materials in organic coatings with detailed descriptions. It contains 200 color charts, including those used by the army and navy.

Gettens, Rutherford J., and George L. Stout. *Painting Materials: A Short Encyclopedia*. New York, NY: Dover Publications, 1966 (Originally published in 1942).

This important and useful book is an unabridged reprint of the 1942 edition. Topics include the following: mediums, adhesives, and film substances; pigments and inert materials; solvents, diluents, and detergents; supports; and tools and equipment. While this book contains references to artists' pigments and is intended for painting conservationists, it can be applied to housepainting because it lists pigments, their manufacture, and paint technology.

Holley, Clifford Dyer. *Analysis of Paint Vehicles, Japans, and Varnishes*. New York, NY: John Wiley & Sons, 1920.

Holley's book describes the chemical analysis of paint, enamel, and varnish based on his extensive laboratory work. He covers various paint and varnish oils, separation of vehicle from pigment, water in paints, water emulsions and emulsifiers, volatile thinner,

extracted oil, effect of storage on paint, solid and liquid driers, japans, shellac and lacquers, and varnish and enamel liquids.

Laurie, A. P. *The Materials of the Painter's Craft in Europe from the Earliest Times to the XVIIth Century with Some Accounts of Their Preparation and Use*. Edinburgh, Scotland: T. N. Foulis, 1910.

A. P. Laurie was a well-known British authority on painting techniques during the early 20th century. This first book is an illustrated overview of European painters' methods and materials.

_____. *The Painter's Methods & Materials*. New York, NY: Dover Publications, 1967 (Originally published in 1926 by J. B. Lippincott Company, Philadelphia, PA).

This book written for the craftsman painter describes the pigments used with oil, tempera, water colour and mural paintings. He also describes light and colour theories.

_____. *The Pigments and Mediums of the Old Masters*. London, England: Macmillan, 1914.

Laurie studies old techniques using chemical examination, microscopic examination, microchemical examination, and by studying old records.

Mattiello, Joseph J. *Protective and Decorative Coatings*. 5 Volumes. New York, NY: John Wiley and Sons, 1942.

A five volume set aimed to "supply basic data and information pertaining to protective and decorative coatings. It is hoped that it will serve the needs of technically trained graduates who enter the industry and also that it will be of help to older and more experienced technologists" (preface). An index is provided at the end of each volume. Volume one covers oil, resins, driers, thinners

and solvents, natural minerals, and ethers. Volume two deals with raw materials, pigments, metallic powders, and metallic soaps. Volume three covers manufacture and uses of coatings; more specifically colloids, oleoresinous vehicles and paints, water and emulsion paints, lacquers, printing inks, luminescent paints, and stains. Volume four addresses the following: wetting; adhesion of dried coatings; adsorption [sic], permeability, water resistance, and structures of organic surface coatings; high-vacuum technologies; and emulsions. Volume five discusses analysis of resins and drying oil, laboratory testing of metal finishes, spectrophotometry and photography of pigments and surface coatings, and resinography.

Mayer, Ralph. *The Artist's Handbook of Materials and Techniques*. New York, NY: The Viking Press, 1957 (Second edition).

This comprehensive source covers many painters materials and methods such as pigments, oil painting, tempera painting, grounds for oil and tempera painting, water color, gouache, pastel, encaustic painting, mural painting, solvents, thinners, gums, casein, glues, waxes, chemistry, and picture conservation.

_____. *The Painter's Craft: An Introduction to Artists' Methods and Materials*. New York, NY: D. Van Nostrand, 1966.

Mayer wrote this book as a college textbook. It contains chapters on color, pigments, grounds, oil painting, tempera painting, aqueous painting, pastel, mural painting, new paints, and equipment.

Massey, Robert. *Formulas for Painters*. New York, NY: Watson-Guption Publications, 1967.

This book contains very valuable information for decorative painters. Massey describes sizes, grounds, paints, mediums, glazes, varnishes, fixatives, and adhesives of

traditional recipes. Useful tables of drying times and melting points are included.

Sabin, Alvah Horton. *Industrial and Artistic Technology of Paint and Varnish*. New York, NY: Wiley, 1917 (Second edition).

Sabin begins this technical work with definitions and history of paint, going back to Greek and Latin quotations. He follows with information on linseed oil, varnishes, japans, driers, rosins, shellac, cellulose, celluloid coatings, and paints.

Welsh, Frank S. "Particle characteristics of Prussian blue in an historical oil paint." *Journal of the American Institute for Conservation*. Vol. 27, No. 2 (Fall 1980), pp. 55-63.

In this paper, Welsh focuses on research to identify the blue pigment used in the Long Gallery and in the Tower Stair Hall at Independence Hall in Philadelphia. Recent paint analyses have shown that Prussian blue, a common eighteenth century pigment, was used here. Eighteenth century Prussian blue agglomerates appear large and angular, while twentieth century Prussian blue agglomerates are small and amorphous. Welsh recognizes light microscopy as the best method for analyzing architectural paint pigments.

Wheatcroft, Andrew, editor. *Adhesives and Coatings*. New York, NY: Routledge, 1992.

This is a textbook for conservators. The chapter 6, "Coatings" takes a scientific look at the qualities and characteristics of paint as a coating. It includes sections on requirements of a good coating, solvent coatings, and reaction coatings.

Repainting Historic Buildings

Once the paint history of a building is uncovered through research and technical analysis, the preservationist faces the issue of appropriate paint treatment for that building. Complex decisions must be made relating to both protective and decorative concerns. From the protection viewpoint, existing painted surfaces, which consist of varying substrate materials plus previously applied paint layers in various degrees of soundness, may require different approaches to ensure that newly applied paint will last and help to conserve the building. From an aesthetic viewpoint, different elements of exterior and interior surfaces must be considered both as a whole and individually, along with the color selection and placement theories appropriate to the period of restoration.

In some cases, only cleaning may be required - or perhaps selective paint removal to uncover a long hidden example of graining or marbling. Usually, however, the best approach consists of proper surface preparation and paint application using a paint color scheme based on the actual colors used for the building during the period of interest.

Given the numerous steps and considerations involved in repainting historic buildings, this major division is divided into nine sections. The first five sections focus on preliminary steps involving failure diagnosis, stripping, surface preparation, and selection of paint and tools. The next, somewhat more comprehensive, section considers paint in its protective role and thus covers the steps and considerations which ensure durability of the newly applied paint. The next two sections consider paint in its aesthetic role, including not only general color selection and placement but also specific decorative techniques (stenciling, graining, marbling, glazing, and sand painting). The final section covers the health and environmental concerns associated with painting.

Diagnosing Paint Failure

The entries in the first section focus on the diagnosis of paint problems and suggested remedies. Some of the entries cover problems irrespective of location, while others concentrate on exterior problems, and a few relate only to interior problems. Typically, the worst problems exist on exterior surfaces due to prolonged exposure to weathering. But interior paint problems also occur; the most common is the peeling associated with calcimine paint.

Bock, Gordon. "What to Do About Peeling Ceilings." *Old House Journal*. Vol. XXI, No. 1 (January/February 1993), pp. 34-35.

Calcimine is a water-based paint used throughout the late 19th and early 20th century to whiten ceilings. Due to later coats of oil-base and then water-base latex paint, moisture, or gravity, the tender calcimine paint may let go and peel. Bock gives many recommendations for removal such as scraping, overcoating, mechanical methods, steam, and wallpaper paste.

Gola, Edward F. "Avoiding Mistakes In Exterior Painting." *Old House Journal*. Vol. IV, No. 6 (June 1976), pp. 1, 9-11.

Gola begins by describing the best time to remove old paint rather than add additional coats: a paint film thicker than 16 mils (0.016 inch) does not allow moisture to pass through it, thus leading to cracking and peeling. In contrast to other authors, Gola recommends burning off or sanding off old paint as the best stripping processes. Actions taken to correct moisture problems should be undertaken only after it is clearly understood whether the moisture originates from the outside (e.g., rain) or the inside (e.g., high humidity in bathrooms). The author presents many useful tips on surface preparation, including treatment for mildew.

Hamburg, H. R., and W. M. Morgans, editors. *Hess's Paint Film Defects: Their Causes and Cure*. London, England: Chapman and Hall, 1979 (Originally published as *Häufige Anstrichmängel und Anstrichschäden, ihre Ursache und Verhütung* in 1938 (Third edition).

This book thoroughly covers topics related to paint failure during storage and application, after application, and after the use of coated objects. He discusses paint failures due to the faults in the liquid paints, drying and cracking, and poor adhesion. A chapter on health hazards was added to this addition.

Howren, J., and M. E. Weaver. "Inquiry Re Adherence of Lead-based and Non-lead-based Paints." *Association for Preservation Technology Bulletin*. Vol. XII, No. 1 (1980), pp. 11-14.

This article consists of reproduced correspondence between Jo Howren, Historic



Checking of paint on this interior door surface has developed due to a loss of elasticity in the top layer of paint. Photo: National Park Service files.

Richmond Foundation, and Martin Weaver, Heritage Canada, regarding reputed problems of adherence between lead and non-lead paints. Following a general discussion of causes of adhesion failure in paints, Weaver suggests that there is nothing inherent in lead paint which would prevent adherence of subsequent layers of non-lead paint. Indeed, Weaver maintains (and quotes other authorities on this point) that in fact lead-based oil paint produces a suitable surface for repainting.

Labine, Clem. "Dealing with Calcimine Paint." *Old House Journal*. Vol IV, No. 5 (May 1976), pp. 2-3.

Pre-existing coats of calcimine paint cause repainting problems because subsequently added paint layers tend to crack and peel. Labine begins with an explanation of the nature of calcimine paint, proceeds to describe how to determine if calcimine paint exists on a surface, and concludes with instruction on calcimine paint removal using steam stripping.

_____. "Don't Blame the Paint." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 93-94.

In this short article, Labine discusses the causes and cures for several types of paint failure: cracking and crazing, wrinkling, peeling, and alligatoring.

Park, Sharon C., AIA. "Exterior Woodwork I: Proper Painting and Surface Preparation." *Preservation Tech Notes*. Washington, DC: Preservation Assistance Division, National Park Service, US Department of the Interior, 1986.

"Ole Jim" gymnasium at Gallaudet College in Washington, D.C. is used as a case study to describe paint failures, surface preparation, and repainting. The paint applied in 1980 failed as a result of wall moisture, incorrect paint, and painting in cold weather. All aspects of the process are explained, including

paint removal, priming, second priming, caulking and applying molding strips, and painting.

Poore, Patricia. "It's Not as Easy as it Looks': Preparation, Priming, Painting." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 84-88.

Poore discusses how to diagnose paint failure and when to paint. She focuses on peeling on masonry, cleaning and scraping, and priming and painting. Paint selection recommendations and a glossary of paint terms are also given.

Spence, J. W., and F. H. Haynie. *Paint Technology and Air Pollution: A Survey and Economic Assessment*. Environmental Protection Agency, Office of Air Programs, Research Triangle Park, North Carolina, February 1972. Available from the Supt. of Documents, U.S. Government Printing Office, Washington, D.C.

This pamphlet has a section titled "Historical Development" with a timeline from 1804 to 1962 of the history of the U.S. coatings industry. Following sections cover paint formulation, paint film deterioration, and effects of air pollution on exterior paint.

Weeks, Kay D., and David W. Look. *Preservation Briefs 10: Exterior Paint Problems on Historic Woodwork*. Preservation Assistance Division, National Park Service, US Department of the Interior, 1982.

This brief gives causes of paint surface conditions and failures. It also recommends appropriate and safe methods for removing paint on exterior wood surfaces. This article contains essentially the same information in *Technology and Conservation* (see next column).

_____. "Paint on Exterior Historic Woodwork: Identification and Treatment of Surface Condition Problems." *Technology and Conservation*. Vol. 7, No. 2 (Summer 1982), pp. 34-46.

While this article contains much of the same information in the *Preservation Briefs 10* article, it also includes a list of definitions, list of safety precautions, chart of exterior paint problems, chart of potential dangers, and chart summarizing paint removal methods.

Removing Paint

Varying approaches to paint removal include chemical, heat and mechanical methods. Some entries approach stripping comprehensively, while others focus on exterior or interior work, specific buildings, materials or other specific topics. The reader is cautioned that stripping remains a somewhat controversial subject. The pros and cons of different options should be explored before a course of action is selected. (For example, some methods - such as sandblasting - receive almost universal negative appraisal.) While it seems generally best to avoid stripping if possible, there are cases when it becomes necessary, for example, when alligatored or peeled paint cannot provide a smooth stable surface for new paint, or when non-original paint layers must be removed to uncover wood or masonry which was originally designed to be exposed.

"48 Paint Stripping Tips." *Old House Journal*. Vol. XI, No. 2 (March 1983), pp. 44-45.

Based on "tried-and-true" submissions from subscribers, this article presents hints and tips covering a variety of paint stripping topics: general tips, coping with especially stubborn paint residue, heat stripping, chemical stripping, the cleaning compound trisodium phosphate (TSP), and scraping and grinding.

Berney, Bruce R. "Removing Woodwork For Paint Stripping." *Old House Journal*. Vol. VI, No. 2 (February 1978), pp. 13, 20-21.

In a departure from the usual practice of stripping architectural woodwork in place, Berney argues for the removal of woodwork with intricate moldings for off-site stripping. The article describes in detail removal methods using common hand tools which avoid splintering and other damage to the wood. After the old deteriorated finish was removed using a steam stripping process, the woodwork was reinstalled and an appropriate varnish was applied.

Bock, Gordon. "Stripping Paint from Windows, Without Breaking the Glass." *Old House Journal*. Vol. XVII, No. 5 (September/October 1989), pp. 39-40.

This article discusses the advantages and disadvantages of different stripping techniques when stripping paint from windows. It includes discussion on scraping, chemicals, heat guns, and cost.

Diedrich, James G. "Chemically Stripping Paint From Exterior Masonry." *Old House Journal*. Vol. III, No. 5 (May 1975), pp. 6-8.

After briefly discussing the situations in which stripping is justified, Diedrich describes the steps in the stripping process: sampling to determine the number of layers to be removed; mixing up a test batch of stripper with viscosity adjusted for the number of layers; trying out the stripper on a test patch; applying the stripper to the surface; hosing off the dissolved paint; and neutralizing the caustic stripper with mild acids.

Gale, Frances, and John C. Robbins. "Removal of Interior Coatings at the Statue of Liberty." *Association for Preservation Technology Bulletin*. Vol. XVI, Nos. 3 and 4 (1984), pp. 63-65.

As part of the Statue's restoration, all coatings were removed from interior surfaces because

they were in poor condition and were hiding corrosion and structural problems. To remove the paint from the copper, the cryogenic coating method was used. This extremely cold liquid spray caused the paint layers to crack and separate from the copper substrate.

Green, Arthur S. "Selecting and Using Chemical Paint Removers." *Old House Journal*. Vol. III, No. 4 (April 1975), pp. 6-8.

Green identifies three cases where paint stripping is justified: a fine hardwood grain subsequently covered by paint; softwood with excessive layers of paint which conceal carvings and moldings; and varnish or shellac that has darkened. He discusses appropriate uses of seven types of removers that vary in suitability for indoor/outdoor use, toxicity, flammability, and other traits. The author then describes preparations to ensure a successful job (and to avoid damaging other objects and yourself). He concludes by describing the actual application techniques.

Hickman, Janet C. "Chemical Paint Strippers." *Old House Journal*. Vol. XIX, No. 1 (January/February 1991), pp. 36-40.

Hickman describes the three basic categories of paint strippers available on the market: methylene chloride-based, caustic-based, and alternative systems. Methylene chloride is used in most strippers because it is fast acting, has low flammability, and does not harm wood and water-based glue; however, it is a toxic substance which must be used only with good ventilation. Caustic strippers (based on sodium hydroxide) are slow, may damage wood and glue, require neutralization, and are harmful to human tissue. New alternative strippers, based on dibasic acid esters (DBEs), are slower acting but less dangerous because they are also non-flammable, rinse with water, and biodegradable.

"Improved Process for Stripping Paint." *Old House Journal*. Vol. II, No. 8 (August 1974), p. 5.

The National Paint, Varnish and Lacquer Association recommends a combination of conventional water-rinsable paint removers and wallpaper steamer for effective paint removal.

Jones, Larry. "Don't Overlook the Heat Plate: It's More Versatile Than We Thought." *Old House Journal*. Vol. XII, No. 1 (January/February 1984), pp. 12-13.

In this short article, Jones describes the use of the electric heat plate, which is used to soften paint prior to scraping with a putty knife or a dentil pick for trim details. He maintains that the heat plate works very much like a heat gun, but is faster in some applications.

Kemnitzer, David A., AIA. "Paint Removal from Historic Interiors." *The Interiors Handbook for Historic Buildings*. Washington, DC: Historic Preservation Education Foundation, 1988.

This article briefly describes five methods of paint removal: mechanical, chemical, thermal, biological and laser.

Labine, Clem. "The Curse of Sandblasting." *Old House Journal*. Vol. IX, No. 1 (January 1981), p. 2.

Sandblasting is not recommended because it damages the environment, masonry, and details. Be wary of waterblasting as well.

_____. "Dip-Stripping to Remove Paint." *Old House Journal*. Vol. X, No. 8 (August 1982), pp. 157-160.

In this article Labine addresses the pros and cons of the controversial practice of removing paint from wood by dipping in tanks of stripping chemicals. With improper use, dip-

stripping may lead to raised grain, loose joints and veneer, and color alteration. The author provides hints on selecting a stripping shop and on handling woodwork, and mentions several important cautions. Labine also includes a valuable flow chart which provides a systematic method for deciding whether dip-stripping is appropriate for a given case.

_____. "Paint-Encrusted Plaster Woes." *Old House Journal*. Vol. XII, No. 6 (July 1984), pp. 111, 124-125.

While most stripping articles address removing paint from wood, here Labine focuses on the problems of removing paint from plaster surfaces. He begins by explaining how one should decide whether existing paint should be left alone, covered up, or removed. He then presents an informative chart which offers the preferred approach in any specific case based on considerations of removal method (abrasion, chemical stripper, heat gun/plate, or moisture) and condition (alligatored paint, peeling paint, or encrusted paint on straight-run moldings or on molded elements).

Labine, R. A. "Tips on Stripping Shutters." *Old House Journal*. Vol. 11, No. 9 (September 1974), pp. 1-2, 8.

This article describes what stripper is most appropriate depending on finish and wood type. The author gives instructions and tips for effective paint removal.

Labine, Roland A., Sr., and Roland Labine, Jr. "Stripping Exterior Paint." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 89-92.

The authors discuss when and how to strip exterior paint. They describe the advantages and disadvantages of several methods and tools such as flame-producing tools, sandblasting, waterblasting, rotary tools, heat tools, electric heat plate, heat gun, and chemical paint removers.

Lichtblau, Julia, with Darla M. Olson. "Uncovering Decorative Painting." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 180-185.

This article is an overview of the many kinds of decorative paintings. After researching paintings, these instructions can help you to uncover and restore the painting. The authors emphasize paint removal and cleaning methods.

Lonnecker, Adrian, and David Miller. "Lye Stripping." *Old House Journal*. Vol. XIII, No. 1 (January/February 1985), pp. 28-29.

While using lye to strip masonry is a dangerous solution, it has proved to be very successful for the authors due to cost, ease of mixing, and ease of use. They give the recipe, supply list, complete instructions, and tips.

O'Bright, Alan. "Exterior Woodwork 2: Paint Removal from Wood Siding." *Preservation Tech Notes*. Washington, DC: Preservation Assistance Division, National Park Service, US Department of the Interior, 1986. (This work also appears in *Association for Preservation Technology Bulletin*, Vol. XX, No. 3 (1988), pp. 82-87.)

This case study of the Harry S. Truman Home in Independence, Missouri deals with the removal of deteriorated exterior paint and repainting. The deterioration was due to moisture penetration and improper painting methods. Tools such as heat guns, putty knives with rounded corners, and paint scrapers were used. O'Bright also discusses the health, safety, and fire considerations of paint removal with a heat gun.

O'Donnell, Bill. "Flow-On Paint Stripping: A Good Compromise Between Hand-Stripping and Dip-Stripping." *Old House Journal*. Vol. XIV, No. 5 (June 1986), pp. 279-281.

Flow stripping is a gentle method in which a methylene-chloride-based stripper is first

sprayed on and then the loosened finish can be scraped off with a putty knife. It is a better method than hand-stripping and dip-stripping because it uses less stripper and recycles it.

_____. "Stripping Beams." *Old House Journal*. Vol. XIII, No. 4 (May 1985), pp. 78-79.

O'Donnell gives instructions on how to strip wood, stressing heat plates and guns as invaluable tools. He also discusses the chemical removal of left over varnish and paint.

_____. "Unwanted Texture Finish." *Old House Journal*. Vol. XIV, No. 8 (October 1986), pp. 374-377.

This article describes the removal of a rough-textured plaster finish. O'Donnell also addresses the removal of sand paint using heat stripping and chemical paint removers.

The *Old House Journal* Staff. "Stripping with the Heat Gun." *Old House Journal*. Vol. VII, No. 11 (November 1979), pp. 126-127.

The *OHJ* staff recommends the heat gun as an effective, safe, and economical method of paint removal. Recommendations and tips are given for proper use, especially with detail work.

The *Old House Journal* Technical Staff. "Commercial Paint Stripping: Sub-contracting Interior Jobs." *Old House Journal*. Vol. XVI, No. 4 (July/August 1988), pp. 29-33.

This article describes the tools and methods used by paint stripping sub-contractors in interior jobs. It includes information about specifications and cost. Two systems are compared in detail, Peel-Away and Bix Process Systems. They also list sources for commercial strippers.

The *Old House Journal* Technical Staff. "Stripping Paint." *Old House Journal*. Vol. X, No. 12 (December 1982), pp. 249-252.

This article discusses the reasons for stripping, the pros and cons of stripping, and lists the tools and methods. There is a flow-chart to help you decide whether to strip or not and a chart listing the various methods for removing paint from wood with the advantages, disadvantages, and safety concerns.

"Our Opinion of 'Peel-Away'." *Old House Journal*. Vol. XI, No. 4 (May 1983), p. 80.

OHJ did not recommend this early formulation of the paint stripping product, Peel Away, and lists several of their complaints.

"Paint Removers: New Products Eliminate Old Hazards." *Consumer Reports*. Vol. 56, No. 5 (May 1991), pp. 340-343.

The *Consumer Reports* staff rated eight chemical paint strippers on price, cost per square foot, ingredients, safety, speed, results, and effort. Five heat guns were tested and rated on price, watts, heat settings, maximum air temperature, safety, speed, handling, and results.

Phair, Matt. "Stripping interior woodwork: a guide to the safest, most effective methods." *Home Mechanix*. Vol. 88 (February 1992), p. 50.

Phair details chemical stripping and heat tool methods for stripping historic, built-up paint on woodwork. His article features some of the problems involved in removing varnishes with the same techniques.

Poore, Patricia. "The Basic of Stripping Paint (From Just About Anything)." *Old House Journal*. Vol. XVI, No. 1 (January/February 1988), pp. 38-43.

Poore explains when it is and is not appropriate to strip paint. She discusses how

to strip woods, clear finishes, metal, marble, interior brick, plaster, and glass.

_____. "Stripping Exterior Masonry." *Old House Journal*. Vol. XIII, No. 1 (January/February 1985), pp. 26-28.

Poore discusses when stripping of masonry is appropriate and when it is not. If it must be done, the homeowner must decide upon the stripper, concentration, soaking time, and pressure/volume of rinse water. She presents the choices of chemical strippers, reviews the dangers of sandblasting, and discusses waste disposal.

_____. "Stripping Paint from Exterior Wood." *Old House Journal*. Vol. XIII, No. 10 (December 1985), pp. 207-211.

Poore discusses what to look for before stripping wood. She also includes stripping methods, hazards to consider, and legal responsibilities of the paint stripper.

Powell, Brian. "Exposing Period Decorative Finishes." *The Interiors Handbook for Historic Buildings, Vol. II*. Washington, DC: Historic Preservation Education Foundation, 1993.

Two techniques for the retrieval of obscured historic painted decoration, mechanical and chemical, are described in this article. The use of infrared photography and trenching as survey techniques are also included. The extensive survey work and exposure of decorative paint schemes in the Salmon P. Chase Suite in the Treasury Department Building is explained in detail.

Reilly, Lawrence J. "A Caustic Approach to Exterior Paint Removal." *Old House Journal*. Vol. II, No. 10 (October 1974), pp. 2 and 5.

This article presents the options and steps involved in removing paint from originally

unpainted masonry surfaces. Reilly focuses on chemical solvents, the most dangerous method.

Tyler, James B. "Taking Down a Ceiling Medallion." *Old House Journal*. Vol. VIII, No. 8 (August 1980), pp. 95-97.

Tyler reveals his method for taking down a ceiling medallion to remove the built-up paint. He recommends a soaking method followed by scraping and brushing to remove the rest of the paint.

Welsh, Frank Sagendorph. "A Methodology for Exposing and Preserving Architectural Graining." *Association for Preservation Technology Bulletin*. Vol. VIII, No. 2 (1976), pp. 70-75.

Paint on architectural graining can be removed by manual means, chemical means, or a combination of the two. At the Vail home in Speedwell Village, Morristown, New Jersey, Welsh softened the paint with xylene, ethyl alcohol, and ethyl acetate and then scraped with a scalpel.

Zirkle, John F. "Removing Exterior Paint." *Old House Journal*. Vol. VII, No. 6 (June 1979), pp. 69-70.

This article discusses safety measures like ladders and blow torch dangers. Zirkle has included other recommendations for removing the exterior paint from a building such as stripping methods, sandpaper, and the aid of professional painters.

Preparing the Surface

These entries describe the preliminary steps necessary to achieve a stable and level surface which provides for adequate adhesion as well as a smooth and even new finish. Although its importance is often overlooked by painting novices, proper surface preparation often comprises a major portion of the labor required for a painting project.

Banov, Abel. *Paints and Coatings Handbook*. Farmington, MI: Structures Publishing Company, 1978.

This book provides detailed guidance on interior and exterior paint specifications, surface preparation and paint application. A paint specification and classification index is included as an appendix.

Bock, Gordon, "Painting Exterior Wood." *Old House Journal*. Vol. XIX, No. 3 (May/June 1991), pp. 26-29.

Bock emphasizes the necessity of understanding the "pathology" of old surfaces as a prerequisite for a successful repainting effort. The article describes several aspects of surface preparation: scraping, repair, washing, caulk and fill work, water repellent application, and priming. Finally, the author stresses the need to pay attention to the type of wood and the nature of the paint when applying the new finish.

Grimmer, Anne E. *Keeping it clean: removing exterior dirt, paint, stains and graffiti from historic masonry buildings*. Washington, DC: Technical Preservation Services, Preservation Assistance Division, National Park Service, US Department of the Interior, US Government Printing Office, 1988.

Important information and technical advice on removing paint and other substances from exterior masonry is outlined in this report. In Part I, Grimmer discusses all aspects of

planning for the cleaning process. Part II includes recommendations for using the "gentlest means possible" and discusses the various cleaning methods.

Labine, Clem. "Don't Paint It-Wash It." *Old House Journal*. Vol. XII, No. 7 (August/September 1984), pp. 142-143.

In many cases, painted surfaces may simply need to be cleaned rather than repainted, especially where historic decorative painting is involved. Labine describes how dirt accumulates on walls and ceilings. For example, fibers are drawn to surfaces by electrostatic charges. Frequent vacuuming or dusting will remove the fibers unless they become embedded in a film of oil or grease. Once embedded, a wet cleaning method using a gentle detergent becomes necessary. The author explains how to use a cleaning poultice for particularly stubborn dirt. He concludes with hints on touch-up painting to repair scratches which may be found after cleaning.

_____. "Preparing To Paint." *Old House Journal*. Vol. V, No. 6 (June 1977), pp. 70-71.

In this short article, Labine describes several considerations related to preparing surfaces for repainting such as whether to clean or to repaint; stripping wallpaper; removal of calcimine paint; removal of alligatored paint; scraping loose and flaking paint; proper lighting; repairing loose plaster and insecure lathing; and the use of joint compound to level surfaces.

_____. "Refinishing Paint-Stripped Woodwork." *Old House Journal*. Vol. IV, No. 1 (January 1976), pp. 1, 9-10.

Labine begins by warning against stripping in cases where it is inappropriate, and retention

of the existing finish, or perhaps repainting or graining, might be the best approach. When woodwork must be stripped, there often



At George Washington's Mount Vernon, a heat plate and a scraper were used to remove the thick layers of paint from the bevelled wooden boards that were cut to imitate dressed ashlar stone. All that is needed before priming is a little light sanding. Photo: Baird M. Smith, AIA, National Park Service files.

remains a disappointing haze along with small flecks of white residue in crevices. The author explains how to camouflage the white residue using an antiquing liquid (a pigmented oil wiping liquid). He then describes how unwanted accumulation of the pigment in cracks and grooves can be avoided by undercoating with unpigmented oil. He concludes by using two coats of unpigmented oil as a final finish.

McNamara, Sarah. "Keeping Brass Beautiful." *Old House Journal*. Vol. XII, No. 3 (April 1984), pp. 55-57.

This article on cleaning and polishing brass contains a section on removing lacquer and paint from brass. The authors recommend several options from chemical strippers to mixtures of household cleaners.

O'Donnell, Bill. "After You Strip...Before You Finish." *Old House Journal*. Vol. XV, No. 1 (January/February 1987), pp. 43-47.

This is an informative article about the important time period between stripping and finishing wood. The author discusses methods of paint removal, the removal of marks, (water stains and burns), carpentry repairs, filling holes, and filling in color with paints.

_____. "Masking Before Painting." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 175-177.

In this article methods are given for protecting floors, wood trim, and wallcoverings from splattered paint.

Phillips, Morgan W., and Brian Powell. "Several Experiences Using Lime Paste as a Cleaning Agent for Oil Paint." *Association for Preservation Technology Bulletin*. Vol. XIV, No. 2 (1982), pp. 30-35.

After trying twenty-one other methods, the authors discovered vinegar and a hydrated lime and plaster of paris mixture worked best for removing soil from illusionistic paintings. Lime proved to be effective, inexpensive, non-toxic, and non-flammable.

"Refinishing Clinic." *Old House Journal*. Vol. X, No. 1 (January 1982), pp. 16-18.

This article briefly describes a variety of refinishing products: filling compounds (paste wood filler, putty, waxy fill sticks), interior primer-sealers, interior stains (surface and penetrating), and interior finishes (penetrating waxes or drying oils, and surface finishes such as lacquers, shellac and varnishes).

Selecting Paint Type

The following entries provide guidance in choosing the type of paint suitable for particular substrates and exposure conditions. There are also discussions regarding the old argument of oil versus latex paints. Particular brands and companies are evaluated. Several of the works identify paint manufacturers whose lines include paint products specifically designed for use on historic buildings.

"Authentic Paint Colors: Inside & Out." *Old House Journal*. Vol. X, No. 5 (May 1982), p. 113.

This short article includes an annotated listing of reputable manufacturers that produce lines of "historic" paint products based on research.

Bock, Gordon. "Whitewash and Calcimine: Paints That Ain't." *The Interiors Handbook for Historic Buildings, Vol. II*. Washington, DC: Historic Preservation Education Foundation, 1993.

This paper examines the application and usage of non-oil, water based paint alternatives. Both whitewash and calcimine were widely used for interior surfaces, and their hand-manufactured character required application methods that were different from ordinary paint. Also included is a historic recipe for whitewash.

_____. "Yes, I still use Whitewash." *Old House Journal*. Vol. XIII, No. 2 (March 1985), p. 49.

In this very short article, Bock presents a strong case for the continued use of whitewash, both as a continuation of historic practices and as a practical matter, since it is inexpensive and adheres well to previously whitewashed surfaces without the necessity of stripping. Whitewash, which is basically lime, and can be easily made and applied using simple materials and tools.

Chase, Sara B. *Preservation Briefs No. 28: Painting Historic Interiors*. Preservation Assistance Division, National Park Service, US Department of the Interior, 1992.

This brief gives recommendations for choosing new paints for historic interiors if repainting is necessary or desirable. It addresses a variety of materials and architectural features, and provides background information about historic paint types and causes of paint failure.

Gozdan, Walt. "Latex Paint." *Old House Journal*. Vol. XIX, No. 3 (May/June 1991), pp. 30-31.

Gozdan identifies the many advantages of latex paints: their colors last, they do not "chalk", they remain flexible while allowing for contraction and expansion, they dry fast, they are vapor-permeable, and they provide easy clean-up and minimal environmental contamination. The author also describes the problems with application of latex over pre-existing oil paints, such as peeling and blistering, and corrective measures.

Grow, Lawrence. *The Sixth Old House Catalog*. Pittstown, NJ: Main Street Press, 1988.

This comprehensive service catalog lists names and addresses of companies specializing in historic paint.

"House Paints and Stains." *Consumer Reports*. Vol. 52, No. 6 (June 1987), pp. 365-374.

Over 300 latex and oil-based paints and stains were tested by the *Consumer Reports* staff. The finishes were rated, based on the following factors: price per gallon, ease of application, sagging, leveling, chalking, hiding, color-change resistance, erosion resistance, and dirt resistance.

"Interior Latex Paints." *Consumer Reports*. Vol. 56, No. 5 (May 1991), pp. 333-339.

Over 200 brands of latex paints were tested on price, gloss, stain removal, scrubbing,

spattering, blocking, water resistance, hiding, and fading.

"Interior Semigloss Paints." *Consumer Reports*. Vol. 54, No. 5 (May 1989), pp. 317-321.

The *Consumer Reports* staff tested eleven brands of alkyd paints and twenty-one brands of latex paints. These paints were tested in the following categories: price, gloss, brushing, leveling, sagging, spattering, scrubbing, water, blocking, hiding, and fading.

Jones, Larry. "Restoration Products: Paint Companies with Historic Paint Colors." *Old House Journal*. Vol. XIII, No. 7 (August/September 1985), p. 152.

Jones provides an annotated list of eleven paint companies which offer historic paint colors.

Kahn, Eve. "Traditional Building's Decorative Painting Sourcelist." *Traditional Building*. Vol. 3, No. 2 (March/April 1990), pp. 11-12.

This comprehensive list of decorative painting sources covers many firms involved in a variety of techniques and materials: gold leafing, graining, glazing, marbleizing, stencils, murals, and trompe l'oeil.

Labine, Clem. "Selecting the Best Exterior Paint." *Old House Journal*. Vol. IV, No. 7 (July 1976), pp. 1, 10-11.

Labine presents a table that describes the properties and uses for seven types of exterior paints. He describes how to interpret the information on paint can labels. He provides basic guidelines for paint selection: use the same brand and type of paint if it has performed satisfactorily, clean and spot prime existing surfaces before adding a topcoat, use a primer where there is excessive chalking,

use compatible primers and topcoats, and use a primer/sealer on new wood. Finally, the author discusses the old controversy of oil-based vs. latex paint, and decides that selecting between these alternatives is mostly a matter of personal preference.

Labine, Clem. "Selecting a Clear Finish for Paint-Stripped Woodwork." *Old House Journal*. Vol. XII, No. 9 (November 1984), pp. 197-199.

The author begins by describing the considerations involved in selecting an appropriate finish: desired degree of gloss; available work time; level of care and energy to be expended; and the need for reversibility. Labine then presents a chart which enables the reader, based on the desired result, to determine an appropriate finish product. Special application notes and specific brand names are given for each product.

McNamara, Sarah J. "Seeing Through Opaque Stains." *Old House Journal*. Vol. XIII, No. 3 (April 1985), pp. 58-59.

Opaque stains are actually more like paints because they contain solids and form a film on the surface. They are popular because they don't build up or peel like paint does. McNamara discusses the appropriate surfaces, application, advantages, and disadvantages of this type of finish.

"Paints for Finishing Touches." *Consumer Reports*. Vol. 55, No. 9 (September 1990), pp. 619-623.

The *Consumer Reports* staff tested sixty-seven woodwork and trim paints in a variety of colors. They were rated on price, gloss, brushing ease, leveling, sagging, adhesion, blocking, hiding, color change, chalking, mildew, and dirt. There is a special section on reducing paint pollution.

Phillips, Morgan W. "Acrylic Paints for Restoration: Three Test Applications." *Association for Preservation Technology Bulletin*. Vol. XV, No. 1 (1983), pp. 2-11.

Phillips proposes the use of acrylic paint in restoration work because it resists yellowing deterioration better than other paints. However, there are problems in application procedures, toxicity, and custom tinting. At the Otis Home, Lloyd Manor, and Morse-Libby House weathering, appearance, and adhesion were tested. Because of the positive results, Welsh suggests using both modern and traditional methods for restoration work.

Poore, Patricia. "Exterior Stains." *Old House Journal*. Vol. XIV, No. 4 (June 1986), pp. 232-234.

The authors discuss the benefits and limitations of both stains and paints, types of stains, product choice for various situations, and application methods. They reviewed stain manufacturer's literature and compiled the products and their features in a handy chart.

Using Painting Tools

Although these entries cover a variety of painting tools, most of them focus on the selection, use, and care of the brush, which has remained the primary painting tool over many centuries.

Battle, Robert. "Brush Care." *Old House Journal*. Vol. XIX, Vol. 3, (May/June 1991), p. 54.

Battle includes not only tips on maintaining paint brushes, but also describes the qualities which define a good brush: wooden handle, nailed ferrule, strong setting, tapered ends, flagged tips, and good feel and balance.

Hardingham, David. "Angry Bees and Danger Overhead." *Old House Journal*. Vol. IX, No. 4 (April 1981), p. 88.

Hardingham gives several tips regarding ladder use for exterior painting.

_____. "One Gallon Covers...Choosing Equipment, Part II." *Old House Journal*. Vol. VIII, No. 11 (November 1980), pp. 159-162.

The second article in the series offers instruction on painting with rollers and brushes. (Wet pads and air spraying are mentioned but not recommended for the occasional painter.) Also discussed are common mistakes that occur when using equipment and solutions to these mistakes.

_____. "A Utility Light for Painting Projects." *Old House Journal*. Vol. VI, No. 9 (September 1978), p. 104.

This very brief article describes an inexpensive and easily built lighting system which can provide well-diffused illumination up to fifteen feet away, thus providing a useful painting accessory.

O'Donnell, Bill. "Cleaning & Maintaining Brushes." *Old House Journal*. Vol. XIV, No. 4 (May 1986), p. 174.

O'Donnell discusses the proper cleaning methods for paintbrushes used with latex and oil/alkyd paint. He also gives tips for cleaning off hardened paint and shellac.

"Paintbrushes." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 171-173.

A good paintbrush is essential for a good paint job. This article lists the qualities of a quality brush, discusses bristles (natural and synthetic), considers size and shape, and describes various speciality brushes.

Applying Protective Finishes

This section deals with paint application in terms of its protective function. Some entries take a comprehensive approach (either as systematic guidebooks or as less organized collections of tips or hints), while others focus on particular substrates (e.g., galvanized metal) or building elements (e.g., windows). Readers seeking general guidance on basic painting techniques - emphasizing the achievement of a durable coating rather than aesthetic considerations - will find this section very helpful.

Bennett, Carroll R. "Paint Maintenance for Interior and Exterior Surfaces." *Journal of Property Management*. Vol. 54, No. 2 (1989), pp. 35-37.

Key factors in the performance of paint include selection, surface preparation, and application. Paint failure is caused by moisture, cracking, wrinkling, chalking, mildew, and checking. The proper paint should be chosen based on performance.

Bock, Gordon. "Early Exterior Paints." *Old House Journal*. Vol. XVI, No. 3 (May/June 1988), pp. 33-37.

Bock discusses the history of various paint components: vehicles; white and colored pigments (including the historic pigment names); and solvents, driers, and binders. He also describes how early paint materials were fabricated (mostly on-site) and applied, and how they changed with aging. Bock then discusses how to achieve the old look using modern materials and methods. He concludes by listing modern suppliers of paint materials and tools useful for achieving the described effects.

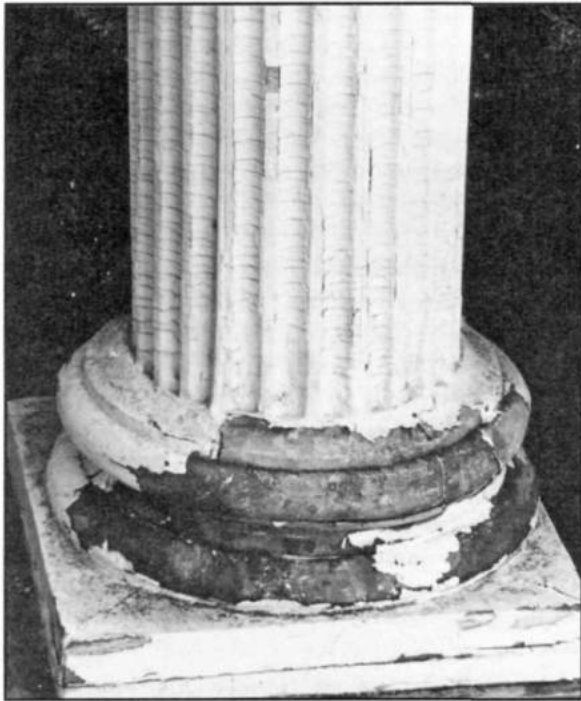
Bracken, John, with Linda Stone. *Restoring the Victorian House and Other Turn-of-the-Century Structures*. San Francisco, CA: Chronicle Books, 1981.

In part two, exterior elements, there is a section devoted to exterior paint. It discusses

when to paint, preparation, application, and color choices. Part three, interior elements, includes recommendations for selecting paint types, colors, surface preparation, and stripping enamel.

Cawley, Frederick D. *Property Owner's Guide to Paint Restoration, Technical Series/No. 1*. Albany, NY: Preservation League of New York State, 1976.

This work includes types of historic paints: oil-base, water-base, distemper, and calcimine. It also discusses the restoration of various paint surfaces and techniques, including the following: marbling, sanding, graining, and polychromatic surfaces. There is also a helpful discussion of choosing paints and maintenance of painted surfaces.



Alligatoring of paint on a wooden column base due to the application of excessive coats of paint. Photo: National Park Service files.

Cotton, J. Randall. "Blasted!...Now What?" *Old House Journal*. Vol. XV, No. 1 (January/February 1987), pp. 38-41.

Cotton discusses the various steps to be taken to preserve a building which has been compromised by the unrecommended practice of sandblasting. Painting is one of several possible remedial measures, and the author describes appropriate surface preparation, paint materials (latex), and application methods. Cement-based paints can be used where there is extensive pitting and cracking. In any event, it is important that the applied coating allow the brick to "breathe" while preventing water penetration.

Hardingham, David. "One Gallon Covers...Part I." *Old House Journal*. Vol. VIII, No. 10 (October 1980), pp. 133-136.

The first in a series of three related articles begins with basic information on the function of paint as a finishing material which protects a surface while providing an attractive appearance. The author then discusses the importance of proper surface preparation, the use of priming coats, and the need for a second coat. Finally, he discusses the use of painting contractors.

_____. "One Gallon Covers...Materials and Strategy, Part III." *Old House Journal*. Vol. VIII, No. 12 (December 1980), pp. 185-188.

This third article in the series describes the use of latex paints, filling cracks, planning a painting campaign, and several small but useful hints regarding efficiency and safety.

Jansen, James. "22 Tips to a Better Paint Job." *Old House Journal*. Vol. XV, No. 6 (November/December 1987), pp. 49-50.

Jansen presents practical hints covering disassembly, preparation, clean up, priming, paint application, and reassembly after painting.

Jones, Larry. "Painting Galvanized Metal." *Old House Journal*. Vol. XII, No. 1 (January/February 1984), pp. 10-11.

Jones begins by explaining why paint peels from galvanized metal. He then explains the steps necessary to paint galvanized metal successfully, including surface preparation, priming, and applying top coats. Specific paint products and suppliers are mentioned.

Labine, Clem. "Restoring Clear Finishes." *Old House Journal*. Vol. X, No. 11 (November 1982), pp. 221, 238-241.

Labine's article helps restorers determine what kind of finish they have (shellac, lacquer, or varnish) and the best method for restoration (cleaning, reviving, and stripping). Insets list commercial finish reviving companies, warn against wax, and give safety tips.

New York Landmarks Conservancy. *Repairing Old and Historic Windows*. Washington, DC: The Preservation Press, 1992.

This book covers three topics related to historic paint. These include the following: analysis of paint failure, ways to remove paint from wood and steel windows, and repainting considerations.

Oherking, Robert, and the *Old House Journal* Technical Staff. "Cast Iron." *Old House Journal*. Vol. VIII, No. 2 (February 1980), pp. 13, 19-22.

Proper maintenance of cast iron often means scraping, priming, and repainting. Tools, processes, and paint types are described in this article.

Old House Journal Technical Staff. "Exterior Painting: Problems & Solutions." *Old House Journal*. Vol. XV, No. 5 (September/October 1987), pp. 35-39.

This article is a collection of questions to *OHJ* and their responses. It includes topics such as

water blasting, masonry paints, lead paint, mold and mildew, lap marks, weathered wood, alligatoring, cedar shingles, blistering, oil vs. alkyd primers, application, knot sealers, and chalking.

Painting and Decorating Craftsman's Manual and Textbook. Falls Church, VA: Painting and Decorating Contractors of America, 1975 (Fifth edition).

This painting and decorating industry handbook covers such topics as paints and coatings, tools and equipment, safety procedures, color, paint failure and solutions, decorative paint finishes, wall coverings, drywall finishing. Also of interest is the dictionary of trade terms covering painting, decorating, wall covering, and drywall installation.

"Painting Doors & Windows." *Old House Journal*. Vol. VIII, No. 12 (December 1980), p. 201.

This article has tips for painting doors and windows. It describes brush types and brush strokes for panel doors, flush doors, and double-hung windows.

Paints and Protective Coatings. US Department of the Army, the Navy and the Air Force. Washington, DC: Government Printing Office, 1969.

This manual furnishes information about products, practices, procedures, materials, equipment, methods, and safety measures used in the application of protective coatings for structures and facilities at DOD installations. A glossary, index, specifications and illustrations are included.

Poore, Jonathan and Bill O'Donnell. "Checklist for Painting." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 190-193.

This article is an outline of proper painting methods with headings of inspection,

planning, setting up, application, and cleanup. Good surface preparation is stressed.

Property owners' guide to paint restoration and preservation. Albany, NY: Preservation League of New York State, 1978.

This pamphlet outlines the problems related to preserving, restoring, and repainting historic finishes. There is also information on historic use of paint, paint analysis, and maintenance of historic paints.

Prudon, Theodore H. M. "The Case Against Removing Paint From Brick Masonry." *Old House Journal*. Vol. III, No. 2 (February 1975), pp. 6-7.

Brick is painted to protect it from water permeation. Prudon explains the options of repainting and removal. He describes the many dangerous side effects of removal.

Rusk, Katherine Knight. *Renovating the Victorian House: A Guide for Owners and Aficionados of Old Houses*. San Francisco, CA: 101 Productions, 1982.

The Chapter entitled "Paint", pages 139-144, covers color theory, choosing paint, hiring an expert, tools, preparation, problem surfaces, filling and cleaning, priming, and tips. In Chapter 26, there is a section on Stenciling, pages 146-147. It briefly discusses Victorian Stenciling and books to use for doing your own stenciling. This book, aimed at the layman, does not deal heavily with historical accuracy or considerations for historic paint.

Shivers, Natalie. *Walls and Molding: How to Care for Old and Historic Wood and Plaster*. Washington, DC: The Preservation Press, 1990.

This book contains information on types of historic paint and decorative paint finishes. The last chapter, "Reviving Decorative Paint

Finishes" helps identify paint finish problems, gives steps for replacing original finishes, and gives a brief description of paint research and analysis.

Wagner, Richard. "Maintenance Tips: Paint--Part I." *Main Street News*. No. 29 (October 1987), pp. 5-6.

This first article in a three part series begins with a brief description of the composition of paint, reasons for paint failure, and maintenance. A helpful chart gives the recommended primer coat and final coat for wood, masonry, and metal surfaces. This first article focuses on wood. Wagner describes paint choices and characteristics for exterior wood surfaces, surface preparation, and application methods.

_____. "Maintenance Tips: Paint--Part II, Exterior Masonry." *Main Street News*. No. 30 (November 1987), pp. 6-7.

This second article focuses on exterior masonry. Paint types and characteristics for exterior masonry, surface preparation, and application methods are described.

_____. "Maintenance Tips: Paint--Part III, Exterior Metal." *Main Street News*. No. 31, (January 1988), pp. 5-6.

Paint types and characteristics for various metal surfaces, surface preparation, and application methods are the focus of this last article.

Waite, John G. "Architectural Metals: Their Deterioration and Stabilization." *Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, VA, and Philadelphia, PA, September 10-16, 1972. Washington, DC: The Preservation Press, 1976, pp. 273-285.

This article mentions many ways in which metals are preserved and stabilized. The most

common method for protecting iron and steel from oxidation is painting. Two very helpful charts are included to describe surface preparation and the types of paints for use on metal.

Selecting and Placing Color

In this section, attention turns from the protective aspect of paint to focus on its aesthetic function. Since tastes change (sometimes radically) over time, the reader should recognize modern preferences as products of our own time and place which should not be applied arbitrarily to historic buildings. Many of the entries in this section encourage sensitivity to the aesthetic tastes which were prevalent during the design and construction of the historic buildings.

Alderson, Caroline. "Re-creating a Nineteenth-Century Paint Palette." *Association for Preservation Technology Bulletin*. Vol. XVI, No. 1 (1984), pp. 47-56.

This paper describes the results of a study of thirty-nine house paint colors popular from 1850 to WWI along with recipes for preparing palette samples. It also contains information about painting traditions such as training practices, economic factors, and manual types.

Conley, Katharine. "Selecting Colors." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 76-80.

Conley approaches the problem of choosing paint colors for historic houses by describing color schemes appropriate to various architectural styles. She provides an illustration and a table of color ranges for each of thirteen different architectural styles. The listed styles range from the 1600s to the 1900s and cover both formal and vernacular buildings.

Flaherty, Carolyn. "19th Century House Colors." *Old House Journal*. Vol. IV, No. 8 (August 1976), pp. 4-6.

Following a brief description of 18th century practice, Flaherty provides representative paint schemes (keyed to the proprietary PPG color system) for seven 19th century styles.

Freeman, John Crosby. "Anything Goes, An Approach to Exterior Colors for Early-20th-Century Homes." *Old House Journal*. Vol. XIX, No. 3 (May/June 1991), pp. 37-40.

Freeman focuses on exterior paint schemes suitable for residential buildings from 1900 to 1940. Since many of these buildings displayed polychromatic schemes, appropriate repainting involves issues of both color selection and color placement. He describes appropriate treatments for double-body bungalows, Dutch Colonial houses, and Foursquare houses (actually a house type manifested in many styles). The double-body design, which included different siding materials and colors on different stories, was frequently used on Foursquares as well as bungalows.

_____. "Anything Goes, Part II: Exterior Color Options for Romantic Revival Houses." *Old House Journal*. Vol. XXI, No. 3 (May/June 1993), pp. 56-59.

During the 1920s, tinted stucco surfaces became popular. This effect was achieved by applying cement paints and then glazing and accenting with tinted linseed oil. Today's quick-drying latex paints can give the same effect. The author recommends some color combinations, gives application instructions, and provides a list of current suppliers.

Martin, James, and Jill Pilaroscia. "Thoughts on Exterior Painting: Colorists Tell How To Get What You Want." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 166-170.

Two colorists discuss the steps homeowners should take to paint their home in a multi-

color scheme. For example, they recommend making a line drawing and coloring it in pencil to stress an understanding of color relationships.

Moss, Roger. "Painting the American House, 1820-1920." *Old House Journal*. Vol. IX, No. 4 (April 1981), pp. 71-75.

Moss gives instructions on how to select colors, references to books on color (his own), and advice on colors and color placement for wood trim, sash and shutters, and masonry buildings.

_____. "You Can't Paint 'Em White Anymore." *Historic Preservation*. Vol. 34, No. 1 (January-February 1982), pp. 50-53.

This brief instructional guide shows how to paint Victorian houses in original, historically accurate colors as opposed to the modern tendency to paint homes white.

_____, and Gail Caskey Winkler. *Victorian Exterior Decoration, How To Paint Your Nineteenth-Century House Historically*. New York, NY: Henry Holt and Company, 1987.

This excellent resource shows how to choose and apply historically accurate paint colors. It includes many helpful charts, drawings, and photographs.

Poore, Patricia and Jonathan Poore, editors. "The Art of Color Placement." *Old House Journal*. Vol. XII, No. 2 (March 1984), pp. 40-42.

The authors list twelve points to consider when developing a polychromatic scheme. Figures illustrate color placement for mouldings and panel doors.

Porter, Tom. *Architectural Color: A Design Guide to Using Color on Buildings*. New York, NY: Whitney Library of Design, 1982.

Porter's treatise on color in architecture covers historical and vernacular examples,

contemporary colors, color perception and environment. Intended for the architect, it contains illustrated examples and recommendations.

Schwin, Lawrence III. *Old House Colors: An Expert's Guide To Painting Your Old (Or Not So Old) House*. New York, NY: Sterling Publishing Company, 1990.

Using line drawings in full color of historic homes from 1743 to the 1920s, Schwin shows which colors were used during different periods. It describes how they were mixed and applied and how to mix current brand-name paints to imitate period colors.

Stoddard, Brooke C. "Homework: Picking the Right Paint Color." *Historic Preservation*. Vol. 39, No. 5 (September-October 1987), pp. 16, 18-19.

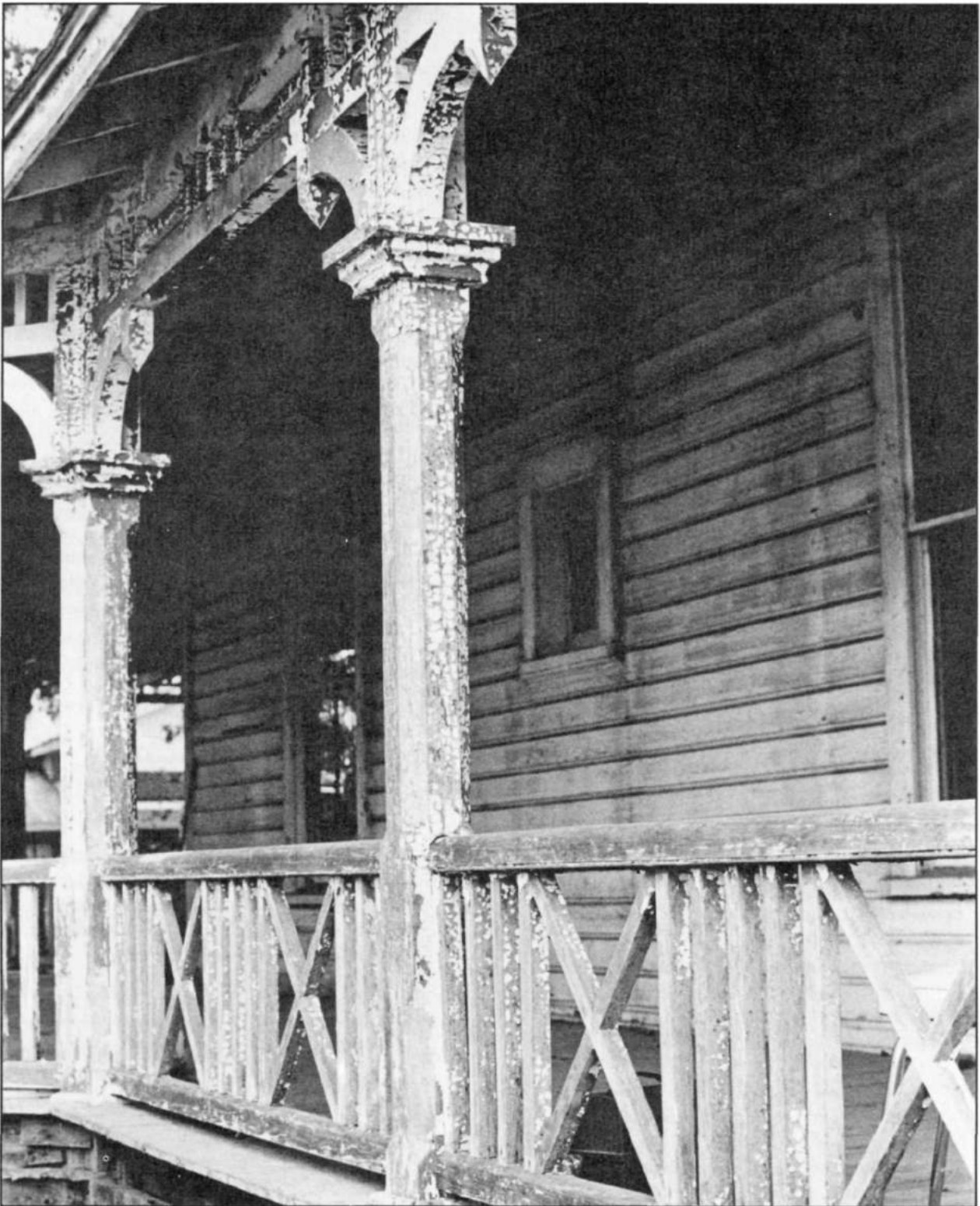
Stoddard answers questions regarding eighteenth and nineteenth-century color schemes, how to detect original colors, and how to repaint historically.

Vila, Bob. "Interior Painting: Old House Restoration." *Popular Mechanics*. Vol. 165 (December 1988), pp. 48ff.

Vila provides a beginner's view to choosing a paint without sacrificing the authenticity of a historic home. He gives an interesting, but simplified, explanation of color cards and historic paint analysis.

Weinstein, Nat. "How to Match Paint Colors." *Old House Journal*. Vol. XII, No. 1 (January/February 1984), pp. 7-9.

Weinstein lists nine pigments which can be mixed to match most colors. He describes the principles of the color wheel and the black-white axis which are used in paint mixing. A color glossary, boxing information, and paint mixing tips are included.



Deteriorated paint can no longer protect exterior wood. The wood surface should be hand-sanded in preparation for repainting. *Photo:* National Park Service files.

Painting For Decoration

In addition to the application of overall color schemes to various surfaces of a building, there are specific decorative techniques which have long been associated with historic buildings. Some of these techniques involve multi-step processes to imitate natural materials such as expensive woodwork or marble, and were traditionally performed by skilled craftsmen. These techniques are being revived today (on both amateur and professional levels), usually as reconstructions of earlier tastes and practices, but also as new approaches involving new materials and methods. The first set of entries covers the use of modern guidebooks to decorative painting, while the remaining entries fall within sub-sections covering stencilling, graining, marbleizing, glazing, and sand painting.

Using Modern Guidebooks

Davidson, Alex. *Interior Affairs*. England: Ward Lock Limited, 1991.

Davidson's contemporary guide to decorative painting techniques covers stencilling, marbling, tortoise-shell, and trompe l'oeil. It gives glaze quantities by room size, a list of varnish manufacturers, and suitable surfaces for different techniques.

Hemmings, Charles. *Painted Finishes*. Secaucus, NJ: Chartwell Books, 1985 (Originally published by Quill Publishing Limited, London).

This how-to guide is useful for creating both traditional and contemporary decorative painting finishes. It includes color illustrations, information on preparing wood and plaster for painting, a "troubleshooter guide", and a short glossary.

Innes, Jocasta. *Paint Magic: The Home Decorator's Guide to Painted Finishes*. New York, NY: Van Nostrand Reinhold Company, 1981.

This source offers a contemporary guide to the imitation of several historical painted finishes. It includes information on a wide variety of wall, woodwork, and floor finishes such as stencilling, wall painting, trompe l'oeil, graining, marbling, tortoiseshelling, floor stencils, marbled floors, and floor cloths.

Marx, Ina Brosseau, Allen Marx and Robert Marx. *Professional Painted Finishes: A Guide to the Art and Business of Decorative Painting*. New York, NY: Watson-Guption Publications, Whitney Library of Design, 1991.

Over fifty-five glazing, marbling, and graining techniques are described with step-by-step instructions and photographs. Of the current decorative finish books, this book seems to be the most complete and detailed. Many varieties of marble and wood are presented. Also of note is the guide to running a decorative finish business.

O'Neil, Isabel. *The Art of the Painted Finish for Furniture and Decoration: Antiquing, Lacquering, Gilding and the Great Impersonators*. New York, NY: Morrow, 1971.

O'Neil bases this technical and instructive guide on classes offered at the O'Neil Studio-Workshop in New York. It gives descriptions of original methods, lists of needed materials, and instructions for imitating various techniques.

Parry, John P. *Parry's Graining and Marbling*. 2nd edition revised by Brian Rhodes and John Windsor. London, England: Collins Professional and Technical Books, 1985 (Originally published in 1954 by Crosby Lockwood and Sons, London).

This is an excellent modern guidebook for creating decorative paint finishes. It

emphasizes faux wood and stone finishes for both American and European types of wood and stone. It includes excellent recipes, color plates, and a glossary.

Sloan, Annie, and Kate Gwynn. *The Complete Book of Decorative Paint Techniques*. New York, NY: Portland House, 1990.

In this beautifully illustrated modern guidebook, Sloan and Gwynn demonstrate many decorative paint finishes. While the history of these finishes is not discussed, the book has excellent instructions and over 500 full-color photographs.

Weinstein, Nat. *Woodgraining, Marbleizing, and Glazing and Related Decorating Techniques*. San Francisco, CA: Walnut Publishing Company, 1988.

Weinstein, a craftsman specializing in decorative finishes, provides an easily understood primer on imitative finish techniques. Although he focuses on graining (especially walnut and oak) and marbleizing, Weinstein also discusses such basic glazing techniques as stippling, striating, and combing. He mentions sources for tools and describes the mixing of glazes.

Stencilling

Bishop, Adele, and Cile Lord. *The Art of Decorative Stenciling*. New York, NY: The Viking Press, 1982 (Originally printed in 1976).

While this contemporary guidebook includes only a short history of stencilling, it can be very useful with its extensive instructions on modern methods for stencilling walls and floors.

Coffin, Margaret. "Decorated Floors." *Early American Life*. Vol. X, No. 3 (June 1979), pp. 48-49.

Freehand and stencilled floors were common decorative treatments during the eighteenth and nineteenth centuries. Coffin describes this technique with period references to the practice. Brief descriptions for stenciling a floor are given.

Fjelstul, Alice Bancroft, and Patricia Brown Schad with Barbara Marhoefer. *Early American Wall Stencils in Color*. New York, NY: E. P. Dutton, 1982.

This contemporary how-to book contains a history of stencil development, step-by-step instructions for stencilling walls, and over seventy full-size color stencils traced from original patterns. There are numerous color photos of historic stencilled rooms as well as a list of sites in New England to see authentic early American stencilling.

Flaherty, Carolyn. "Creating a Victorian Hallway." *Old House Journal*. Vol. IV, No. 11 (November 1976), pp. 1, 6-9.

Flaherty describes the process used to create a Victorian period effect in the Old-House Journal editorial office hallway of an 1883 brownstone. The walls were divided into a dado (using graining in imitation of wainscoting) and a frieze (using stencilling). A stencilled wipe line was also added above the dado. Glazing, a translucent coat applied over the painted wall, provided a mellow patina on the walls, but was left off the ceiling; a deeper shade glaze was applied to the cornice molding. This project created an effect which was actually richer than the original historic treatment.

_____. "Early American Wall Stencilling." *Old House Journal*. Vol. III, No. 1 (January 1975), pp. 1, 8-11.

Flaherty begins by describing the journeymen artists responsible for early stencilling. She

describes the usual historic locations for stencils such as friezes, borders, and large patterns applied all over surfaces. Flaherty discusses in detail the colors and patterns used historically. She concludes with a brief discussion of the tools required (paint, stencils, cutting tools, brushes) and tips for application. A separate inset page provides information on relevant books, paint sources, stencil pattern sources, and professional stencilling services.

Flaherty, Carolyn. "Victorian Stencilling." *Old House Journal*. Vol. III, No. 2 (February 1975), pp. 1, 10-11.

Flaherty begins with a brief discussion of Victorian stencilling practice. Although wallpaper was the dominant wall treatment, elaborate stencilling was used in some cases. Since such intricate applications cannot easily be reproduced without extensive craft training, the author focuses on the use of stencilling with wall painting as a practical approach for homeowners. Specific areas suitable for stencilling include the following: frieze, cove (a molding between ceiling and cornice), ceiling, and wipe line (just above the wainscoting or dado). Flaherty concludes by suggesting sources of inspiration for stencil patterns.

Handler, Mimi. "The Stencilled Wall." *Early American Life*. Vol. X, No. 2 (April 1979), pp. 20-23.

Stenciling was a popular New England wall treatment during the late-eighteenth and nineteenth centuries. Handler gives a brief history of stencilling and describes the supplies and techniques for stenciling today.

Jansen, James. "A Stenciller's Tools and Techniques." *Old House Journal*. Vol. VIII, No. 6 (November/December 1989), pp. 32-37.

This well-illustrated article gives general instruction on stencilling, covering creation of

patterns, selection of paint (latex is recommended) and tools, conducting a trial, and the actual stencilling procedure. There is also a detailed list of needed supplies and addresses of suitable suppliers.

Labine, Clem. "The 'How To' of Stencilling." *Old House Journal*. Vol. IV, No. 11 (November 1976), pp. 10-11.

In this brief instructional article, Labine presents the essence of stencilling technique in a very concentrated form. Photographs illustrate the various steps required to complete a three-color stencilling project.

_____. "Stencilling Secrets." *Old House Journal*. Vol. XI, No. 5 (June 1983), pp. 97, 108-110.

In this instructional article, Labine presents the basic facts about stencilling. After briefly summarizing the history of stencilling, the author describes sources of patterns, stencil materials, making stencils, paints, brushes, and the stencilling application process.

_____. "Stencilling Secrets: Techniques For Laying Out Border Patterns." *Old House Journal*. Vol. XI, No. 6 (July 1983), pp. 126-127.

In Labine's second stencilling article, he provides numerous tips for planning out stencilled border patterns.

_____. "Stencilling Secrets: Laying Out All-Over Patterns On Walls." *Old House Journal*. Vol. XI, No. 7 (August/September 1983), pp. 152-153.

This final article in the series explains how to plan stencilling for an entire wall design on graph paper. Step-by-step measurement instructions are given.

Martin, Gina. "Stencilled Wall Designs." *Association for Preservation Technology Bulletin*. Vol. V, No. 2 (1973), pp. 63-65.

The author describes how she finds, preserves, and restores historic stencil designs. She plans, prepares the surface, cuts stencils, mixes the paint, and paints using the stencil.

"Painted Floors." *Old House Journal*. Vol. II, No. 12 (December 1974), p. 8.

This article briefly explains the floor painting processes of stencilling and spattering.

Smith, Yvonne Brault. "Stencilling the Aaron Conant House." *Early American Life*. Vol. VI, No. 3 (June 1975), pp. 22-25.

In this short article, the author describes the process used to apply stencils to an eighteenth-century house at Strawberry Banke in New Hampshire. The applied stencils do not reflect the actual historic paint treatment of the house, but were added to accommodate its modern use as a coffee shop. The author includes stencil designs, reproduced in color, which can be easily traced.

Ventrone, Gen. "Three Ways to Stencil Walls." *Early American Life*. Vol. IV, No. 5 (October 1973), pp. 58-63.

In this unconventional article, Ventrone discusses several methods of stencil application but advocates the use of brush-stroke stencilling to disguise the effect of the stencil. This method involves using the paper stencil as a guide for sketching the design on the wall with a lead pencil, thus completely transferring the entire pattern all over the room before painting begins; the designs are then stroked in using small water-color brushes. The author claims historical precedence for this method in fifteenth and sixteenth-century France and England, and in late eighteenth and early-nineteenth century

Connecticut. The article also includes several stencil patterns suitable for reproduction.

Witsell, Rebecca. "Restoring 1919 Stencils." *Old House Journal*. Vol. XIII, No. 3 (April 1985), pp. 55-57.

Witsell explains the process her company uses to trace remnants of stencil patterns, cut a new stencil, priming and painting of the original wall surface, and re-stencilling.

Graining

Freeman, Allen. "Faux-Arts: The Revival of Imitative Decorative Painting is Opening New Horizons in Residential Restoration." *Historic Preservation*. Vol. 43, No. 1 (January/February 1991), pp. 48-51, 69-70.

Freeman focuses on the decorative technique of graining. He gives a history of its use and discusses many current restoration projects.

Jordan, Stephen. "The Fine Art of Graining: How to master the historical imitation of wood, using paint." *Old House Journal*. Vol. XX, No. 1 (January/February 1992), pp. 20-25.

Jordan's article is an excellent introduction to decorative graining. He discusses the tools, surface preparation, ground coat, simple glazing formula, and need for samples. He describes the techniques for imitating oak (along with photographs) as well as walnut, mahogany, rosewood, and maple.

Schrambling, Regina. "The Illusionist's Art." *Historic Preservation*. Vol. 37, No. 6 (December 1985), pp. 26-31.

Specialist Marylou Davis creates the illusion of fine hard woods and marble with paints and ordinary pine. The article describes her work and gives a history of the craft.

Weinstein, Nat. "The Art of Graining." *Old House Journal*. Vol. VI, No. 12 (December 1978), pp. 133, 137-140.

In this first part, Weinstein lists the materials needed and gives the properties necessary for a glaze. He describes sanding, patching and filling, base coating, mixing the glaze, and tools. Weinstein describes and illustrates several dry brush techniques.

_____. "The Art of Graining, Part II." *Old House Journal*. Vol. VII, No. 1 (January 1979), pp. 5-6.

This second part discusses how to topgrain, adjust the glaze, and gives special instructions for graining doors.

Zucker, Howard. "How To Grain Like A Professional." *Old House Journal*. Vol. III, No. 6 (June 1975), pp. 1, 8-11.

The grained finish is made up of a background coat, a wood grain made with a stain, and a varnish coat. Zucker describes this process as well as tools, pickling, and touch-ups. A short history of graining is included.

Marbleizing

Jansen, James. "Marbleizing." *Old House Journal*. Vol. XVII, No. 1 (January/February 1989), pp. 43-48.

In this illustrated article, Jansen begins by marbleizing with glaze, covering several steps: the ground coat, broad veining, fine veining, and the finish. As an alternative to oil-based products, he suggests how marbleizing can be undertaken using latex paints. Jansen then describes mechanical techniques: string lashing, template marbling, and latex and oil. The article also includes glaze formulas.

"Marbleizing." *Old House Journal*. Vol. III, No. 3 (March 1975), pp. 8-9.

This short article includes a history of marbleizing, a listing of where marbleizing was used, and the basic steps illustrated with a few photos.

Martell, Carol. "In Imitation of Marble." *Early American Life*. Vol. XIV, No. 4 (August 1983), pp. 53-55.

Painting to imitate marble is a decorative treatment dating back to 1705 at the Capitol at Colonial Williamsburg. This how-to article lists the tools and supplies and describes the techniques for imitating carrara and sienna marble.

Wells, Joan. "Renewing a Marbleized Mantel." *Old House Journal*. Vol. X, No. 6 (June 1982), p. 126.

Wells, an innkeeper, describes the step-by-step process she used to clean and restore her marbleized mantel.

Glazing

Jansen, James. "How to Glaze Walls and Ceilings: Fine Points of Technique." *Old House Journal*. Vol. XVI, No. 1 (January/February 1988), pp. 26-33.

Jansen describes the many aspects of the glazing technique in this well-illustrated article. He begins with basic instruction on getting supplies, surface preparation, application of the base coat, application and wiping of the glaze coat, and application of a protective varnish. He then describes more complicated techniques: polychrome glazing, sponging, rubbing, graduated blending, silhouetting, and texture glazing. Jansen also provides specific glaze recipes as well as fifteen glazing tips.

Weinstein, Nat. "Glazing: An Easy Traditional Route to Rich-Looking Walls." *Old House Journal*. Vol. XI, No. 10 (December 1983), pp. 215, 229- 231.

Weinstein, a specialist in decorative paint finishes, provides an introduction to the techniques involved in glazing. He gives a basic glaze formula and the specific methods for tissue-paper mottling, stippling, and steel wool striating.

Sand Painting

Leeke, John, "Sanded Paint." *Old House Journal*. Vol. XIX, No. 3 (May/June 1991), pp. 32-36.

Leeke provides a case history of the sand paint recoating at the Victoria mansion in Portland, Maine. He describes the sand and paints used as well as the testing, preparation, and application process employed.



Museum technicians engaged in recreating c. 1860s marbling on the stucco surface of Arlington House, Arlington, Virginia, an early 19th century mansion. *Photo: George Siekinen.*

Flaherty, Carolyn. "Sand Paint." *Old House Journal*. Vol. VII, No. 9 (September 1979), pp. 104-106.

Flaherty discusses the eighteenth and nineteenth-century use of sand paint to make wood resemble stone. Sand paint may be appropriate for period buildings where wood occurs with stone, on such elements as window and door frames, verandas, decorative trim, and railings. Although pre-mixed sand paints are available, the preferred method involves blowing sand onto wet paint. There are several steps in the application process: surface preparation, priming, painting, blowing on sand, and repeating the painting and blowing operation.

Health And Environmental Hazards

Unfortunately both historic paint and modern painting materials represent potential hazards to people and the environment. Lead is a very common component of historic paints which continues to pose health problems today. Lead mitigation is a controversial subject still under development. Currently, paint manufacturers continue developing and testing paints that replace substances harmful to people (e.g., mercury) and the environment (volatile organic compounds, or VOCs) with safer products. Paint stripping is also inherently dangerous, since many of the chemicals that are used as effective strippers also pose serious health hazards. Newer, safer chemical strippers are available, but often are very slow acting or have other drawbacks. The following entries discuss ongoing developments and suggest practical protective measures.

Agocs, Mary M., Ruth A. Etzel, et al. "Mercury Exposure from Interior Latex Paint." *The New England Journal of Medicine*. Vol. 323 (October 18, 1990), pp. 1096ff.

Mercury can form many poisonous compounds. Symptoms of Mercury poisoning

can be as follows: sweating, cramping, itching, increased heart rate, low-grade fever, personality changes, redness, scaling, and weakness.

"Baltimore Takes Lead on Lead Paint." *American City and County*. Vol. 103, No. 7 (July 1988), p. 50.

A common problem with historic homes is lead paint. This article describes some steps for removing lead paint including posting warning signs and clean-up according to Baltimore's 1988 legislation.

Berger, Warren. "Lead: Home Toxic Home." *Real Estate Today*. Vol. 25, No. 8 (September 1992), pp. 20-25.

This article discusses the liability, cost, and testing involving real estate brokers who sell homes with lead-based paint. Fifty-seven million homes have lead paint in them and a national clean-up would cost \$100 billion. Private citizens are currently responsible for lead cleanup. Insets cover state lead laws and regulation of the abatement industry.

Byrne, Richard. "Some Architectural Conservation Health Hazards." *Association for Preservation Technology Bulletin*. Vol. XI, No. 2 (1979), pp. 23-29.

Byrne covers many of the health hazards associated with restoration work. Some of these concerns are lead poisoning from lead paint, heart attacks due to mythelene chloride, aplastic anaemia and leukemia from benzene, and fire damage caused by flammable paint removers.

Consumer Product Safety Commission. *Final Environmental Impact Statement on Lead Content in Paint*. Volume 1. Washington, DC: Consumer Product Safety Commission, 1977.

The goal of this proposal is to control levels of lead paint in consumer products. The

section on lead in pigments describes the history of lead use and properties of lead pigments.

Henderson, Nancy. "The Day I Decided to Get the Lead Out." *Kiplinger's Personal Finance Magazine*. Vol. 46 (July 1992), p. 65.

Henderson describes the health hazards of lead based paint which can be found in homes painted before 1978, when lead paint was outlawed. She gives tips on testing for and removing lead. Levels are not recommended to exceed .06%.

Henkenius, Merle. "Ozone-Friendly Paints." *Popular Mechanics*. Vol. 169, No. 8 (August 1992), pp. 63-64.

The debate continues over the quality of water-based vs. oil-based paints. Switching entirely to water-borne paints is a possible solution to the strict VOC regulations. Reducing solvents that produce volatile organic compounds lowers the quality of oil-based paints making frequent re-painting necessary. Companies who manufacture water-based paints comply with the requirements of the Clean Air Act more easily than oil-based.

Kemezis, Paul. "Wait-and-See Stance Taken on Zero-VOC Architectural Paints." *Chemical Week*. Vol. 151, No. 14 (October 14, 1992), pp. 52-53.

Glidden was the first company to produce major architectural paint lines with no VOCs. Besides being more friendly to the environment, VOC-free paint performs as well as conventional latex paint and has an extremely low-odor. However, its main disadvantage is its reduced color range.

Knight, Katherine. "Restoration Materials in the 1990s: California Leanin' is Becoming a Reality." *Old House Journal*. Vol. VIII, No. 6 (November/December 1989), pp. 28-31.

Knight discusses the new legislation on solvents in finishes in California. These new

regulations, which reflect environmental concerns, affect the use of Volatile Organic Compounds (VOCs) in paints, and can be expected to extend to other states in the near future. The author describes low-VOC alternative coatings; some water-based latex products already have extensive testing and usage histories, but most high-solid products are currently being tested and refined. Knight includes a list of suppliers of alternative coatings, wood preservatives, and strippers.

"Lead Poisoning While Stripping Paint." *Old House Journal*. Vol. VIII, No. 4 (April 1980), p. 38.

Lead can be absorbed by swallowing or breathing dust containing lead. This article describes the symptoms and precautions to observe when dealing with lead paint. Safety scores are given for several paint removal methods.

Levinson, Nancy. "Goodbye, Old Paint." *Architectural Record Technology*. Vol. 180 (January 1992), p. 42.

Volatile organic compounds (VOCs) must be lowered in paints to comply with anti-pollution legislation. New paints are being developed but they lack the strength of the old solvent-based paints.

_____. "Preservation Dilemma: Lead." *Architectural Record Technology*. Vol. 180 (January 1992), p. 43.

This article describes the artistic and historic considerations of removing lead paint. Three methods used in the abatement of lead paint are removal by scraping, encapsulation with wallpaper, and replacement by non-lead based paint. This article could be very beneficial to the preservationist whose concerns are to preserve the old paint and to accurately portray the historic nature of an interior.

MacDonald, Marylee. "Getting Rid of Lead." *Old House Journal*. Vol. XX, No. 4 (July/August 1992) pp. 47-54.

In this comprehensive article, MacDonald discusses the problem of lead poisoning caused by lead paint. Children are especially vulnerable to chalking paint, chewing on painted surfaces, and eating paint chips. Abatement can be achieved through mechanical removal, chemical removal, encapsulation, and replacement. The author describes tools and techniques the homeowner can use to remove lead on window sashes, window glass, window sills, doors, walls, stairs, floors, exteriors, and foundations. Disposal precautions are also given.



When removing paint, it is always important to take safety precautions. Face masks are specially important when working with lead-based paint that becomes airborne during scraping.
Photo: National Park Service files.

Martone, Camille M. and Sharon C. Park, AIA. "Preservation Technology Update: Lead-Based Paint in Historic Buildings." *Cultural Resources Management Bulletin*. Vol. 13, No. 1 (1990), pp. 23-30 (This work also appears in *Association for Preservation Technology Bulletin*. Vol. XIX, No. 4 (1987), pp. 55-62).

At the present time there are no formal standards regarding the removal of lead paint. Therefore decisions regarding the removal of lead-based paint in historic properties must use common sense. This article describes the health hazards, detection methods, and abatement options. Following this is a list of recommendations and precautions for abating lead while preserving the historic character of the building and protecting the health of the worker. Finally, there is a list of organizations and research sources for abatement and a reading list.

being removed from solvents, other components of paint and coating formulation, such as resins, pigments, and additives, must be adapted as well. This series of short articles discusses how it will affect finishes and how paint manufacturers are reacting.

O'Donnell, Bill. "Restoration Health Hazards." *Old House Journal*. Vol. XVI, No. 1 (January/February 1988), pp. 44-49.

Both paint stripping and paint application can be very dangerous. O'Donnell discusses hazardous stripping chemicals such as methylene chloride, methanol, benzene, toluene, and the dangers of removing lead-based coatings. Mineral spirits and turpentine used in application are also dangerous.

Mullin, Rick, with Elisabeth Kirschner. "Reformulation Continues as the VOC Target Broadens." *Chemical Week*. Vol. 151, No. 14 (October 14, 1992), pp. 37-45.

Environmental concerns are forcing paint companies to produce products which eliminate VOCs, lead, and heavy metals, without sacrificing performance. With VOCs

The *Old House Journal* Technical Staff. "Danger: Restoration May Be Hazardous To Your Health." *Old House Journal*. Vol. IV, No. 5 (May 1976), pp. 9-11.

Most of this article pertains to the health risks associated with paint removal. The hazards include the paint removers themselves, fire

hazards, and lead poisoning. Procedures for lead paint testing are given.

"Paint Strippers, Take Note." *Old House Journal*. Vol. X, No. 5 (May 1982), p. 98.

Here again the dangers of lead poisoning are emphasized, precautions are listed, and symptoms are discussed.

Park, Sharon C., AIA. "Managing Lead in Building Interiors: An Emerging Approach." *The Interiors Handbook for Historic Buildings, Vol. II*. Washington, DC: Historic Preservation Education Foundation, 1993.

This article discusses alternatives to the complete removal of lead based paints in housing. An emerging approach in reducing lead poisoning of children is to eliminate sources of ingestible lead from their environments, such as lead in water, lead glazes on pottery, lead from chalking or deteriorating older paints, lead dust from renovation or remodelling, residual lead in soil, and lead laden dust brought into the home.

"Pigment Innovations for the 1990s." *Modern Paint and Coatings*. Vol. 82, No. 3 (March 1992), pp. 36-46.

Environmentally friendly coatings are being sought by paint companies. The demand is for further product improvements and higher quality.

"Safety Alert: Lead-Based Paint." *Consumers' Research Magazine*. Vol. 74 (March 1991), p. 32.

The author describes ways to minimize your exposure to lead and the risks of living in a home with lead in it.

Springer, Neil. "Solvents: With or Without Them." *Chemical Marketing Reporter*. (October 19, 1992), pp. sr 22, sr 25.

The Environmental Protection Agency is negotiating regulations with the architectural coatings segment that would limit VOC emissions. This will keep pressure on solvent producers and paint companies well into the twenty-first century.

Stieglitz, Maria. "Homework: Safety First." *Historic Preservation*. Vol. 41, No. 4 (July 1989), pp. 10-13.

In this short article, Stieglitz answers questions regarding the removal of lead paint, heating guns and propane torches to strip paint, and paint removal using solvents.

Conservation

Conservation is a broad term that encompasses technical examination, preservation, protection and maintenance. The entries in this section range from general conservation practices and principles to individual conservation techniques such as proper cleaning or protection methods for painted architectural surfaces. Paint conservation can be considered as an alternative to reproduction or replacement.

Canning, John. "Covering/ Encapsulating Decorative Wall Treatments to Ensure Long-term Preservation Options." *The Interiors Handbook for Historic Buildings, Vol. II.* Washington, DC: Historic Preservation Education Foundation, 1993.

This article examines several methods of protecting original surface decoration that are not standard conservation practices. Included are historic and modern methods of stretching canvas, both below and applied directly to the ceiling surface, skim coats that produce new wall surfaces, and protective wall varnishes.

Fram, Mark. *Well-Preserved: The Ontario Heritage Foundation's Manual of Principles and Practice for Architectural Conservation.* Ontario, Canada: The Boston Mills Press, 1988.

This Canadian manual is designed to tie together conservation practices and principles. Page 164-167 discuss aspects of exterior paint such as the mechanics of paint, cleaning and preparation, and choosing colours. Pages 176-177 deal with the preservation, protection, maintenance and removal of historic paints.

Matero, Frank G. "Methodologies for Establishing Appropriate Decorative Finish Treatments." *The Interiors Handbook for Historic Buildings.* Washington, DC: Historic Preservation Education Foundation, 1988.

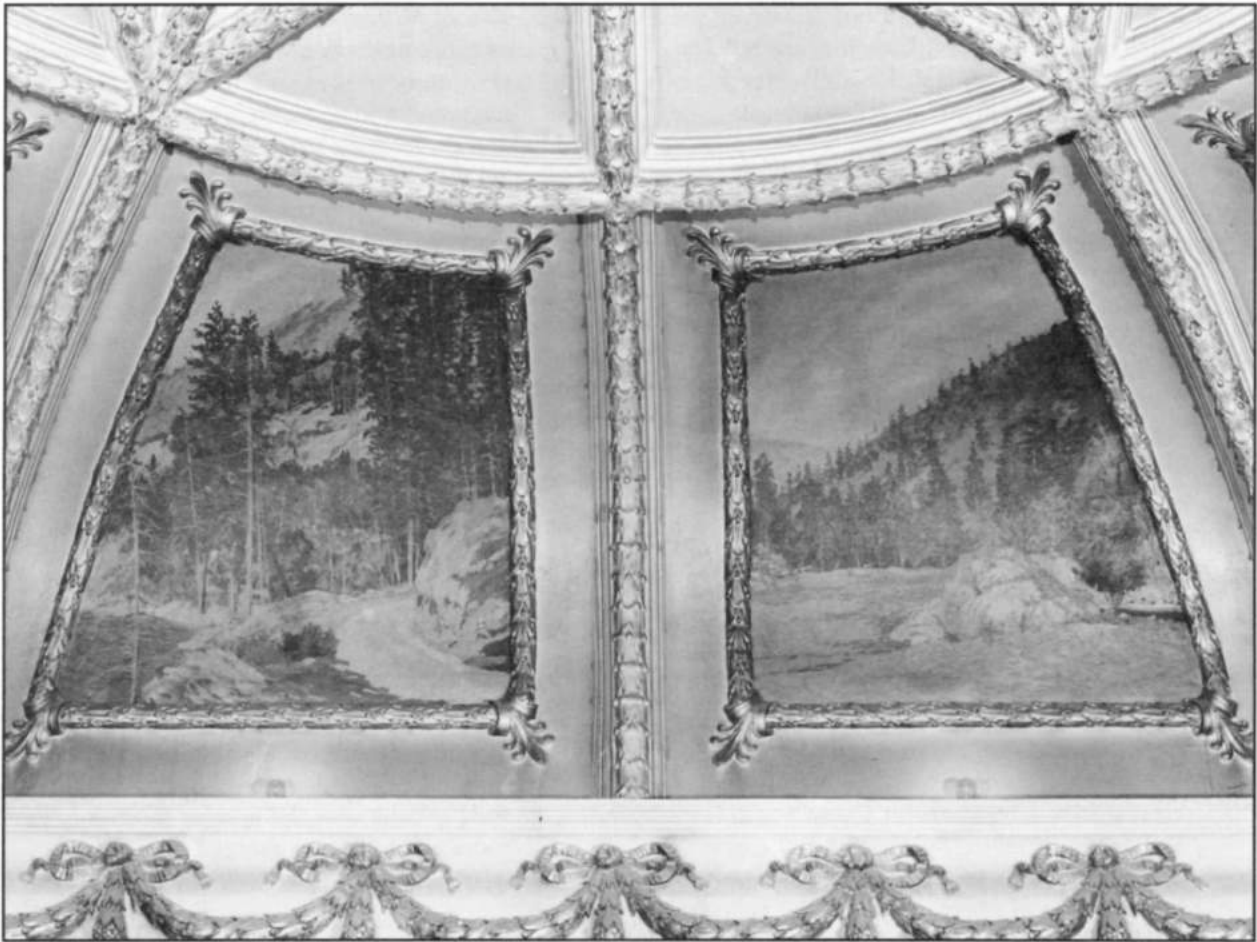
This paper written for the 1988 Interiors Conference for Historic Buildings examines several diverse projects that involve the restoration of historic interior finishes. Three case studies provide a broad range of appropriate solutions that include replication, conservation and a combination of the two.

Mora, Paolo, Laura Mora and Paul Philippot. *Conservation of Wall Paintings.* London, England: Butterworths, 1984.

This book gives a history of decorative wall painting techniques and pigments, technical information on historic surface substrates, and conservation and cleaning techniques. It focuses more specifically on the conservation of historic murals and frescos, and is written for the fine arts conservator.

Zucker, Joyce and Deborah Gordon. "Decorative Finishes: Aspects of Conservation and Cleaning." *The Interiors Handbook for Historic Buildings.* Washington, DC: Historic Preservation Education Foundation, 1988.

This article addresses the issue of cleaning historic decorative finishes as an approach to conservation, one not commonly applied to architectural finishes. Cleaning can help in stabilizing the appearance of the surface. The author describes several cleaning methods.



Sometimes painted decoration may include canvas panels that are works of art. A painting conservator should be consulted to properly clean the surface and, if necessary, apply a clear protective coating to the panels. Photo: National Park Service files.

Case Studies

As with most of the specializations within preservation, professional historic paint analysis and restoration usually involves the application of research, analytical, and preservation techniques to a specific building (or small group of buildings). Since a report associated with one of these projects is usually intended only for the involved client, it tends to be produced in very limited quantities and therefore does not achieve wide distribution. However, some of these reports employ methodologies useful to others pursuing similar work and are therefore published in the preservation literature. The following entries represent several such projects with potential utility for other preservationists.

Eiseman, Alberta. "A Painter's Passion: Connecticut Orate Capitol Inspired Painter John Canning's Reverent Three-Year Restoration." *Historic Preservation*. Vol. 41, No. 2 (March/April 1989), pp. 22-27.

In conjunction with Columbia University's Center for Preservation Research, John Canning, an ornamental painter, replicated the original decoration of stencilling, murals, and cast plaster at the capitol building in Hartford, Connecticut. This article summarizes Canning's work through interviews and illustrations.

Flynt, William A., and Joseph Peter Sprang. "Exterior Architectural Embellishments." *The Magazine Antiques*. Vol. CXXVII, No. 3 (March 1985), pp. 632-639.

At Deerfield Village in Deerfield, Massachusetts, paint analysis has been used to study the exterior architectural details of several of the homes.

Hodkinson, Ian. "Conservation and Transfer of an Early 19th Century Painted Room." *Association for Preservation Technology Bulletin*. Vol. XIV, No. 1 (1982), pp. 17-35.

Hodkinson describes a four phase process used to restore, transfer, and conserve the Croscup Room, a nineteenth-century painted room from a house in Karsdale, Nova Scotia, which was moved to the National Gallery of Canada in Ottawa. Phase one involved examination and documentation, consolidation of fragile surfaces, removal and packing, and transportation. Phase two, conducted in conservation laboratories at Queen's University, involved the attaching of a new support system consisting of aluminum honeycomb and fiberglass reinforced polyester resin. Phase three involved the removal of protective facings and old varnish layers, and the restoration of the paintings by filling, retouching, and application of a new varnish coating. Phase four consisted of reassembling the room as an exhibit at the National Gallery.

Matero, Frank G., and Constance Silver. *Examination and Analysis of the Interior Architectural Finishes of Room H144, House of Representatives, U.S. Capitol Building*. Washington, DC: Office of the Architect of the Capitol, 1988.

In an attempt to restore this room to its original 1855 appearance, an extensive investigation of the architectural finishes was undertaken. This report focuses on the overpainted architectural elements such as the walls, trim, sash, doors, shutters, and cast iron enframements. The whole process is

described from the methodology to the expert's assessment to their recommendations.

Minhinnick, Jeanne. "Some Personal Observations on the Use of Paint in Early Ontario." *Association for Preservation Technology Bulletin*. Vol. VII, No. 2 (1975), pp. 13-31.

The author advocates the discovery, analysis, preservation, and reproduction of original paint as essential for presenting a picture of a country's past. She advocates using paint mixed from original ingredients instead of using ready made paint. The article includes several color photographs illustrating decorative painting at Upper Canada Village.

Mosca, Matthew John. "The House and Its Restoration." *The Magazine Antiques*. Vol. 135 (February 1989), pp. 462-473.

In this case study of the restoration of Mount Vernon, Mosca describes how paint analysis is used to determine the interior finishes in each room and how they changed over time.

Pandich, Susanne Brendel. "Restoration of the Abbey Murals at the Pennsylvania State Capitol." *Association for Preservation Technology Bulletin*. Vol. XXIV, No. 1/2 (1992), pp. 14-20.

Brendel describes the complex process involved in removing four large-scale canvas murals from the building's rotunda for cleaning and restoration. Prior to removal, preliminary analysis of the murals was undertaken to determine the materials used and the condition of the paintings; the analysis involved advanced techniques such as X-ray diffraction, laser microprobe spectroscopy, infrared absorption, and gas liquid chromatography. Some cleaning and consolidation were carried out before moving the murals due to their deteriorated nature. A special roller reception device was created to remove the paintings. After removal, the murals were carefully restored, including

extensive cleaning and removal of non-original overpainting. A new mural mounting system was designed for their reinstallation. Final retouching and application of a protective varnish were carried out after the murals were hoisted back to their final positions.

Park, Sharon C., AIA. "Finishes Number 1: Process-Printing Decals As A Substitute For Hand-Stencilled Ceiling Medallions." *Preservation Tech Notes*. Preservation Assistance Division, National Park Service, US Department of the Interior, September 1990.

This case study of the restoration of the Central Search Room at the National Archives in Washington, DC, describes the use of process-printing decals on a clear background as a less time consuming and cost effective alternative to hand stencilling. While this technique proved successful because the medallions replaced were repetitive in nature and viewed from a distance, it shouldn't be considered as a replacement for the craft of stencilling.

Phillips, Morgan. "Discoloration of the Old House Paints: Restoration of Paint colors at the Harrison Gray Otis House, Boston." *Association for Preservation Technology Bulletin*. Vol. III, No. 4 (1971), p. 40.

This article discusses problems in determining original colors of old paints and surface characteristics through a case history approach.

_____, and Christopher Whitney. "Restoration of Original Paints at the Otis House." *Old Time New England*. Vol. 62, No. 1 (July 1971), pp. 25-28.

This case history of the restoration of the Otis House discusses how the paints changed over time, characteristics of old paints, how paints are analyzed, and techniques for reproducing them.

Schlichting, Carl. "In-Situ Treatment of Paints: A Ukrainian Catholic Church." *Association for Preservation Technology Bulletin*. Vol. XX, No. 4 (1988), pp. 14-18.

The author describes the in-situ methods used to conserve paintings on canvas and stencilling on wooden walls at an early twentieth-century church in Alberta, Canada. The canvas paintings were cleaned, adhesion loss restored, infill painting completed, and a protective varnish applied. The stencilled patterns were restored by applying steam to plasticize the wrinkled paint and softening the underlying shellac, allowing the wrinkles to be flattened and the paint to be moved back to its original position.

Seldon, Marjorie Ward. *The Interior Paint of the Campbell-Whittlesey House, 1835-1836*. Rochester, NY: The Landmark Society of Western New York, 1970.

This guide, originally published in 1949, describes the color selection for the interior of this Greek Revival structure. References to historic paint techniques are also included.

Welsh, Frank S. "Documentation of the 1902 Paint Colors of the Florida State Capitol." *Association for Preservation Technology Bulletin*. Vol. XII, No. 2 (1980), pp. 117-121.

As part of the preliminary research required for restoration of Florida's 1902 State Capitol, the Tallahassee Preservation Board discovered contemporary photographs as well as the text of a former governor's speech which referred to original paint colors used in the building. These documentary sources provide valuable corroboration for Welsh's microscopic paint analysis, which identified Munsell color matches as well as paint medium and surface quality.

Welsh, Frank S. "Microchemical Analysis of Old Housepaints with a Case Study of Monticello." *The Microscope*. Vol. 38, No. 3 (1990), pp. 247-257.

Microscopically analyzing paint on historic buildings gives important information about the order of additions and alterations and identifies the original paint colors and composition for an accurate restoration. In this case study Mosca examines the Dome Room at Monticello, Thomas Jefferson's home in Charlottesville, Virginia. Based on his findings the Thomas Jefferson Memorial Foundation was able to repaint and restore the room to Jefferson's design.

_____. "The Peter Wentz House: 18th Century Sponge Painting in Pennsylvania." *Association for Preservation Technology Bulletin*. Vol. VII, No. 2 (1975), p. 124-130.

In this short paper, Welsh documents an authentic eighteenth-century example of sponge painting. A small sponge, dipped in paint, was dabbed on the plaster dados of the walls at the Wentz House to create a decorative effect. Some of the patterns were created by combining sponge painting with brush painting. Welsh used microscopic examination to determine the 18th century date for the sponge painted decoration. Photographs are included to graphically depict the decorative design.

_____, and Charles L. Grandquist. "Restoration of the Exterior Sanded Paint at Monticello." *Association for Preservation Technology Bulletin*. Vol. XV, No. 2 (1983), pp. 2-10.

A sanded paint finish is created by dusting sand onto wet paint. Door and window architraves and columns at Monticello were finished in this way. This article describes the analysis, surface preparation, and application process for restoring this finish. Numerous illustrations of the work in progress are included.

Reference Works

Both novice and experienced preservationists require access to the vast literature which has developed regarding historic architectural paint, which indeed, is the purpose of the present bibliographic listing. The following bibliographies and glossaries provide additional information sources for students of historic paint. The *Munsell Book of Color* constitutes the major reference for the paint analyst.

Allen, Eugene. "Paint Color Research and House Painting Practices." *Association for Preservation Technology Newsletter*. Vol.1, No. 2 (August 1969), pp. 5-19.

This short bibliography, compiled in 1969, is an early attempt to gather sources pertaining to Early American paint finishes. In this bibliography, the authors intended to outline the topics related to housepainting and to organize the bibliography so as to suggest the variety of sources available. The subject headings include business records, letters, advertisements, paint specifications, measure's accounts, manuals, "house histories", new books and articles, and "receipt" books. Most of the forty-three sources are either annotated or abstracted.

Gagne, Cole. "Glossary of Historic Paints." *Old House Journal*. Vol. XIV, No. 4 (May 1986), pp. 178-179.

This brief but useful glossary presents important information on historical paint materials, including the following: oil-based paints, including sand paint; water-based paints such as whitewash and the distemper paints (calcimine and casein); and a section on colors which identifies the various historic pigments used to produce blue, brown, green, red, yellow, white, and black.

"A Glossary of Painted Finishes." *Old House Journal*. Vol. XVI, No. 1 (January/February 1988), pp. 34-37.

This concise glossary contains descriptions of twenty-two historic paint finishes, ranging from the conservative to flamboyant.

McKinstry, E. Richard. *Trade Catalogues at Winterthur: A Guide to the Literature of Merchandising, 1750 to 1980*. New York and London, England: Garland Publishing, 1984.

Materials referenced in this bibliography of trade catalogues reside in the trade catalogue collection at the Winterthur Museum in Delaware.

Morton, W. Brown, III. [et al.]. *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings*. Washington, DC: National Park Service, 1992.

These guidelines explain when and how to identify, retain, and preserve painted finishes by listing what is recommended and not recommended in various circumstances. Many components and materials of both the building interior and exterior are mentioned.

Munsell, A. H. *The Munsell Book of Color*. Two Volumes. Baltimore, MD: Macbeth, a division of Kollmorgen Instruments Corporation, 1976 (Subject to period reissue. In 1991, Macbeth relocated the Munsell sales office to P.O. Box 230, Newburgh, New York 12551-0230).

The Munsell Color system is regarded as the standard nomenclature for historic paint analysis. It uses numerical designations for colors in terms of hue, value, and chroma.

Nelson, Lee H., editor. "Paint Color Research and House Painting Practices." *Association for Preservation Technology Newsletter*. Vol. 1, No. 2 (August 1969), pp. 5-19.

This short bibliography, compiled in 1969, is an early attempt to gather sources pertaining

to Early American paint finishes. In this bibliography, the authors intended to outline the topics related to housepainting and to organize the bibliography so as to suggest the variety of sources available. The subject headings include business records, letters, advertisements, paint specifications, measure's accounts, manuals, "house histories", new books and articles, and "receipt" books. Most of the forty-three sources are either annotated or abstracted.

Voltz, John. "Paint Bibliography." *Association for Preservation Technology Newsletter*. Vol. IV, No. 1 (February 1975), supplement.

Sources in this bibliography were compiled primarily from material in Avery Library and New York Public Library. References include material on color theory, color selection, and paint technology and chemistry.

Romaine, Lawrence B. *A Guide to American Trade Catalogs, 1744-1900*. New York, NY: Dover Publications, 1960.

This bibliography of American trade catalogs contains thirty-five listings of paint catalogs, color lists, and price charts. Symbols denote where these sources are located.

Segal, Martha. *Microscopy: bibliography on the use of the microscope in the identification of raw materials and methods of manufacture of stone artifacts and buildings; Ceramics; Glass objects and glazes; And paintings and pigments*. 1976.

This bibliography compiled in 1976 includes references for analysis and identification by microscopy, spectral analysis, polarizing microscope, x-ray diffraction, petrology, and photomicroscopy. Some of the subjects include pigments, paintings, works of art, buildings, and historic monuments. Sources date from 1947 to 1974. It is designed for those concerned with conservation science and microscopic evaluation of artifacts.

Thompson, Eleanor McDowell, compiler. *Trade Catalogues at the Winterthur Museum: Guide to the Microfiche Collection*. Bethesda, MD: University Publications of America, 1991.

Materials referenced in this bibliography reside in the trade catalogue collection at the Winterthur Museum in Delaware. These Winterthur materials have been reproduced as black and white microfiche.

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