NINETEENTH-CENTURY PAINTED DECORATIONS

IN BRITAIN AND AUSTRALIA:

AN APPROACH TO CONSERVATION

in Two Volumes

Volume Two
(Appendices)

DONALD ELLSMORE

submitted for the degree of Doctor of Philosophy

UNIVERSITY OF YORK

Institute of Advanced Architectural Studies

May 1993

CONTENTS

Page Number

ILLUSTRATIONS

Figures

Appendix A

APPENDIX A
NOTES ON DECORATOR'S MATERIALS AND TECHNIQUES

1. Painting Materials and Procedures

The painting of rooms and building interiors was traditionally undertaken by house-painters who often worked with hazardous materials under arduous conditions. However major changes occurred during the nineteenth century with the growth in interest in painted decorations and the introduction of new materials and techniques.

House-painting early in the nineteenth century is usually discussed in terms of the poor standing of the trade due to a reputation for sharp practices and an association with poisonous materials. An upturn in the status of the profession was formally noted by the Encyclopaedia Britannica in the early 1840s.[1]

The principal costituent in most ordinary colours was white lead ground in oil. It was the base of the most common types of oil paints. Spirits of turpentine came into use increasingly as a diluent to thin oil paints and to reduce gloss levels in flatted work. Driers such as litharge and sugar of lead were commonly added in small quantity to aid in the drying of the paints.

The other main branch of house-painting was distempering.[2] Decoration could be produced on walls and ceilings with almost equally good effect by distempering. In the first decades of the nineteenth century, distempers were sometimes applied by plasterers and can be thus be considered also within the trade of plastering.[3]

---

[1] Encyclopaedia Britannica, X, 207C, 1842, p.730.

[2] Distempering is the term now common in the painting trade to refer to the application of glutinous medium water paints. A distemper is a paint made with a glutinous medium for use on walls, ceilings and in scene painting.

[3] New South Wales Government Schedule of Contract, 1836 and 1864. This lists distempering in the trade of plastering.

Most high class house-painting was undertaken in smooth, flat, finishes by the process of flatting in oil colour. The process was time consuming and therefore costly. Late nineteenth-century decorators sought to achieve flatted finishes in materials other than flatted oil paint to achieve better economies in detailed work.

The terminology used to describe the characteristics and qualities of house-paints includes the following definitions regarding colour, which can be quantified in terms of hue, value and chroma, the coordinates of the Munsell system. Hue refers to the place of the colour in the spectrum (say a red or a blue). Value refers to the darkness or lightness. Colours of low value are near to white and colours of high value are near to black. The strength of the colour, (such as its redness or blueness), is referred to as the chroma. 'Signal' red is thus a colour of strong chroma.

Tint is the term which refers to colours mixed on a white base. Coloured pigments were added to white to produce tints of the colours. When black or a complementary colour was added it produced a shade of the original colour.

Colour names sometimes took their names from the pigments from which they were mixed. Colours like Brunswick green and Prussian blue were the names given to colours produced from pigments of the same name, without the addition of another pigment. Colour names such as 'dove', 'olive' or 'pearl' were used and well understood because of their association with common counterparts. Most colours derived their name from one or other of these origins.

Tempera

Tempera,[4] or distemper as it was called by house-painters, was composed of water colour bound with a liquid medium of size[5] or one of the substitutes used to bind distemper colours, such as milk, albumen,[6] vegetable gums and flour starch. Common whiting formed the base of most distempers and calcimine.[7]

Distemper was considered to have advantages over oil paints when applied to the walls of public buildings such as churches, assembly rooms, concert halls; indeed, any place in which people might congregate in numbers. During the Victorian era, when gas illumination was in general use and mechanical ventilation still rare, condensation forming on surfaces inside buildings posed a significant problem. It was unacceptable to have rivulets of water streaming down the face of oil painted walls. However it was possible to conceal and reduce the condensation by the use of the more absorbent distemper finish.

Distemper had the advantages of ease of application and a dense, flat, even finish, which could be readily washed off and re-worked.[8] It is rare to find any substantial build-up of distemper when researching the physical evidence of interior house-paints, the evidence having been removed in all but a few instances during preparation for re-painting. It was not possible to apply distemper or

[4]The word 'tempera' originally included all mediums. With the gradual prevalence of oil about five centuries ago, its meaning was narrowed to refer only to mediums prepared from egg. It now means gum, glue or egg bound paints.

[5]Size is an impure form of gelatin, containing also a similar substance known as chondrin. It was commonly manufactured by boiling bone, horn, or other animal matter in water, and evaporating the product to dryness.

[6]Albumen is the white of an egg. It has very good binding properties.

[7]Calcimine was a cold water paint supplied in powder form, requiring only the addition of water to bring it to the correct brushing condition.

[8]References to Daniel Cottier's work at Dowanhill, Glasgow confirm that the process of rubbing in and washing out went on for weeks until Cottier was satisfied with the results achieved in distemper.

calcimine over an old finish of the same, as the absorption of the existing distemper finish would cause streaking. Therefore the first layer had to be washed off before another could be applied.

The problem of absorption in new or freshly laid plaster was overcome by an application of clearcole (*claire colle)* as a preparatory coating. This was a coating of unpigmented size applied direct to the bare plaster to provide a smooth impervious film to counteract the suction of the plaster. The presence of this film is a useful aid in research as it is often provides the only evidence of early distemper finishes which have been removed in preparation for oil or other impervious paint finishes.

Oil Colour

The most common and usual base for nineteenth-century house-paint was white lead, a mixture of lead carbonate and lead hydrate (a hydrated oxide of lead). White lead was regarded as having greater body or covering power than any other pigment and was therefore used as the base for most tints and many shades. The body and (white) colour was derived from the carbonate whilst its ability to combine chemically with the oil medium, with which it was ground, was imparted by the hydroxide.

The oils preferred for use in nineteenth-century paints were the drying oils.[9] Only the true drying oils were ideally suited for use as paint mediums. The property of solidifying, or drying, was well marked in linseed oil, poppy oil and a few others.

Linseed oil has the remarkable property of taking oxygen from the air and giving off carbon dioxide and water. This drying reaction was found to be slowed down by cold damp conditions so the oil was modified for many uses by

[9]Drying oils are oils which have the property of forming a solid, elastic substance when exposed to the air in thin layers.

boiling with a pigment or oxidising agent to accelerate the drying process. However the dark colour of boiled oil made it unsuitable for light tints, for which paste dryers were preferred.

Oil paints were thinned with the diluent, turpentine - a volatile oil or spirit from the turpentine tree - added to harden the paint. Turpentine served to facilitate better mixing of the oil and pigment media. Additionally turpentine provided a means of flatting the gloss of the paint by decreasing the proportion of oil.

The preparation of oil paints in the nineteenth century was a laborious function which severely threatened the health of painters, since white lead is a toxic poison.[10] Young painters often spent long hours of an apprenticeship grinding colours, as the following account recalls:

> *He called for the key to the shop [of his employer] each morning at 5 am...to open at 6am...where he had to grind the colours all day long till 8pm...(9am to 4pm in winter).*[11]

It was difficult under such conditions for painters to avoid the illness called 'painter's colic'.[12] However, white lead gave way to the use of zinc oxide and, to a lesser extent, barytes; non-poisonous pigments with excellent paint-forming qualities. Barium sulphate, later called barytes, became an important filler in paints late in the century when the English manufacturer, John B.Orr discovered a method of treatment which facilitated the conversion of the artificially precipitated barium sulphate into a very usable pigment called lithopone.

---

[10]Lead has been banned from use in most modern paints.

[11]James Ballantine, The Life of David Roberts, compiled from his journals and other sources (Edinburgh: 1866) p.3.

[12]Painter's colic was the term given by the trade to lead poisoning.

Whiting, the base of distempers, remained in common use throughout the nineteenth century. In general, whiting could be any white pigment made from a clay or chalk base. It was not suitable for oil paints because it either lost its lustre, darkened or became transparent in the oil medium.

Many different types of oils were tried in oil paints but the drying oils, especially linseed oil, proved to be the most satisfactory. The drying oils which were most suited to paint manufacture had the quality of forming strong films by the absorption of oxygen without turning rancid. Cold drawn linseed oil was best suited for use in pale tints because of its light colour. However being slow drying it needed dryers to promote drying and hardening.

Oil of turpentine, the most plentiful of the essential oils commonly used in house-paints, was the other important constituent of the finish in high quality flatted work. The turpentine counteracted the film forming properties of the oils, thus reducing the level of gloss, proportional to the ratio of turpentine to oil in the paint. Flatted oil paints had very low gloss levels due to the dispersal of the pigment caused by the thinning action of the turpentine in the surface layer.

Pigments

Pigments are finely ground materials which are suspended in discrete particles in the paint medium. At one time pigments were characterised according to their main use. Those which were unaffected by alkalis were classed as permanent and suitable for fresco work.[13] Today they are classified according to their source or method of production as natural, artificial, synthetic or mixed.[14]

[13]Paul Hasluck, House Decoration: A practical Guide to Painter's and Decorator's Work, (London: Cassell and Co., 1910) pp. 66-68.

[14]Paola Mora, Laura Mora and Paul Philippot, Conservation of Wall Paintings (London: Butterworths, 1984) pp.56-57.

The choices available to decorators of the period were extensive. One English manufacturer in the 1880s could offer in the order of 250 individual colours.[15]

The most important nineteenth-century development in the use of pigments resulted from the developments in chemistry and manufacture. A colour such as Brunswick green, which was mixed from a pigment named after the district where it was manufactured, was widely used during the period 1850-1950. For most of this period however it was mixed artificially by combining Prussian blue and chrome yellow. The latter is a fugitive pigment under the effects of sunlight or alkaline conditions. Brunswick Greens therefore fade to a blue colour when exposed to light over a period of time.

Many pigments were unstable under the effects of light and humidity, which could cause changes in their colour value (ie hue and chroma). Some pigments tend to lose colour during long-term exposure to light whilst moisture promotes chemical activity which can lead to a colour shift. Even the weakest acids will destroy carbonates and diminish the chroma of pigments such as blue lapis lazuli and ultramarine.

It is common to note degradation in blue oil colours due to the effect of the acidic linseed oil medium. The blues form a sensitive group since there are few naturally occurring inorganic blue pigments. Many of the popular nineteenth-century blue pigments were manufactured.

Prussian blue is the earliest modern synthetic colour[16] whose manufacture was discovered during the long search by European scientists for a permanent blue pigment. The

[15]See The Journal of Decorative Art, April 1881, p.46. Pontifax and Wood, paint manufacturers, listed colours on offer including 30 blues, 40 browns, 50 greens, 45 lakes, 20 yellows, 47 reds and others in proportion.

[16]Rutherford J. Gettens and George L. Stout, Painting Materials, a Short Encyclopaedia (New York, Dover, 1966) pp.193-194.

manufacturing process was improved over the years and the colour remained popular for both internal and external paint use in either pure form or modified with chrome yellow to produce Brunswick green.

Freshly plastered surfaces presented problems for decorators wishing to work with a large palette of colours. However these could be overcome by the application of an inert layer of size or paper to newly laid plaster onto which decorations could be safely painted.

Recent studies reveal that some pigments are ozone fugitive.[17] Several categories of artists' pigments fade substantially in the dark when exposed to ozone. Since ozone is used in some air conditioning systems this could have significant consequences for the long-term conservation of painted decorations in historic buildings being adapted for new uses.

A feature of the use of nineteenth-century paint colours is the manner in which subtle shifts in fashion and the availability of pigments resulted in changes in the manner in which popular colours were mixed. The very popular colour 'drab' was initially mixed from yellow ochre and black which gave a greenish cast to the colour. Later it was mixed more commonly from raw umber alone, giving the colour a reddish cast. Knowledge of such changes can be used in dating paint finishes.

Likewise a schedule of the generally available pigments and their time of general introduction, or first commercial production, can be an important tool in dating paints or identifying pigments. Most pigments did not appear in house-paints prior to their commercial

[17]D. Grosjean, P.M. Whitmore, C. Pamela De Moor, G.R. Cass and J.R. Druzik, 'Fading Alizarin and Related Artists' Pigments by Atmospheric Ozone: Reaction Products and Mechanisms', Environmental Science and Technology, Vol 21, (1987), pp.635-643.

manufacture. For example zinc oxide was first produced commercially in 1835; lithopone[18] was not produced until 1847, and titanium dioxide was not used until 1908.

Fresco Techniques

Attempts in the 1840s to introduce fresco painting in England initially centred on the *buon fresco*[19] technique. This involved the application of the design and colour to fresh moist plaster in a way which allowed the colour to bond with the plaster as it dried. The pigment bonded with superficial carbonate as the lime set, forming an integral bond. The lack of success with this technique in England is usually blamed on an unsuitable climate.

Many artists wishing to work in the medium experimented with *fresco secco*[20] techniques. In *fresco secco* the artists applied the paint onto a dry plaster surface. The pigments were fixed by a medium with which they were mixed before their application. The mediums used by artists in Britain included size, oil, wax and various silicates. The wax medium was favoured by the Audsleys, at least:

> *Wax painting is unquestionably next to fresco in beauty and architectonic propriety of effect. It has much of its brilliancy; and closely approaches it in depth of tone, and that absolute freedom from gloss so essential in architectural decoration.*[21]

A method of wax painting, called 'Spirit Fresco', was developed by Thomas Gambier Parry, the West Country landowner, amateur painter and influential figure in the movement to revive the use of colour in churches. Spirit fresco laid claim to being the best and most convenient to

[18]Lithopone is a combination of zinc sulphide and barium sulphate.

[19]The *buon fresco* technique of painting involved the application of pigments in water to fresh wet plaster.

[20]*Fresco secco* was a method of painting which achieved a finish like fresco by the application of fresco-like finishes in oils or other mediums.

[21]W.& G.Audsley, Polychromatic Decoration, p.17.

use of all the fresco mediums.[22] The material was composed of wax, resins and volatile oils which were mixed by the decorators themselves.[23] The technique proved to be durable on stable grounds (Spirit fresco decorations in St Michael and All Angels, Lyndhurst, Dorset,[24] 1864 and St Leonard's, Newland, Worcestershire,[25] 1865, survive in excellent condition) however an unacknowledged difficulty in mixing and maintaining colour consistency on the job might account for the limited use of the medium.

Experiments with fresco-like paint finishes produced a painting method called water-glass, or stereochromy. The method involved the application to plaster of pigments mixed with plain water in the manner of *buon fresco,* which were then fixed with a coating of potassium or sodium silicate known as water-glass.

The process was improved in the 1880s by the German chemist Adolf Keim of Munich who developed the *mineral-malerei* paint. This process involved the mixing together of the binding agents with the pigments on site in a one-step application. However Keim's palette was limited to the small number of mineral pigments which were compatibile with the silicates.

---

[22]Parry was a founding member of the Ecclesiological Society in whose journal, The Ecclesiologist, the wax painting technique he developed specifically for use in the English climate was announced in 1863.

[23]Peter Burman, 'Thomas Gambier Parry, Country Gentleman, Artist and Collector', Bada Handbook 1990, pp.36-40. Parry's son, Ernest described how his father mixed the volatile materials over a fire on his own property then applied them to plaster which had been prepared by washing over with pure spike oil.

[24]See *fig.123.* The chancel painting executed in Gambier Parry's spirit fresco medium, 'The parable of the wise and foolish virgins' by Frederick Leighton, 1864, is believed to be the first fresco to be painted in an English church since the reformation.

[25]See *fig.91.* The church features a decorative scheme which covers the entire wall surfaces. The decorations were executed in 1865 by Clayton and Bell in Thomas Gambier Parry's spirit fresco medium.

Washable Distempers

In the 1870s the so-called washable distempers came into prominance. The most widely used was 'Duresco', a paint with similar properties to Keim's *mineral-malerei*. The washable distempers derived their name from their flat finish and permanence. They had the advantage of being simple to mix and apply, and they were permanent. The dead flat finish of washable distempers made them very desirable for use in painted decorations.[26]

'Duresco', manufactured by the Silicate Paint Company,[27] had a major impact on decorative work as the following account records:

> *Few innovations in connection with the painting and decorating trades have been responsible for so great a change in working methods as the introduction of Duresco. When placed on the market, about fifty years ago, this famous water paint rapidly won world-wide popularity. It was found to give a surface possessing respectively all the charm of distemper, and the permanence of flat oil paint, while at the same time requiring fewer coats, and being more easily and more rapidly applied than the latter material. Though innumerable materials similar to Duresco have since been introduced. It is the opinion of many users that it more than holds its own.*[28]

'Duresco' attracted attention in the 1880s. The Journal of Decorative Art recorded a visit to the Sanitary Paint Company's works at Liverpool in 1881 and described the manufacture of silicate distemper. This was prepared from a petrifying liquid made with silica and gums which could be combined with oil and water to produce a stable non-poisonous distemper[29] which was considered to be superior

[26]Gloss finishes were less favoured because they were subject to light reflections which distorted the visual purity of the painted decorations.

[27]The Silicate Paint Company was established by the manufacturer, J.B.Orr and Company of Charlton, Kent, for the purpose of promoting and marketing their new materials, Charlton White and 'Duresco'.

[28]The Australasian Decorator and Painter, 1 January 1925.

[29]The Journal of Decorative Art, June 1881, pp.66-67.

to kalsomine.[30] The range of ready-mixed 'Duresco' colours numbered 36 after twenty years of development (*fig.125*).

The base of 'Duresco' was Charlton white, the pigment first manufactured in 1874 at the Charlton, Kent, factory of J.B.Orr and Company.[31] Also known as Orr's white, or lithopone, it was considered to be a very good substitute for white lead in interior work.

Other forms of washable distempers were produced in less durable forms by the introduction of conventional carbonates to oils made miscible with size by the addition of some solvent or medium common to both, together with the addition of enough alkali to saponify the oil and render it compatible with water. The washable distempers, as a group, were quite similar in application and characteristics to modern emulsion paints however they were distinguished then by the common characteristic of being laid on a prepared ground in the manner of conventional distempers. In high quality work the final coat was stippled also to ensure an even dispersal of the wet film and thus achieve a dead flat finish.

The use of washable distempers was gradually phased out as new materials of similar characteristics made by less costly production processes were introduced. The use of zinc white pigments similar to the base pigment of 'Duresco' were increasingly preferred for house-painting and decoration. The increasing use of zinc oxide is reflected in the study of New South Wales house-paints reported in Case Study No.13.

---

[30] 'Kalsomine' derived its name from calcimine (ie. distemper). It was composed of sodium carbonate, linseed oil, size and whiting mixed hot with water. It became so commonly known that the term 'kalsomine' became synonomous with calcimine and distemper.

[31] 'Duresco' was manufactured on a base pigment produced from the mutual decomposition of barium sulphide and zinc sulphate.

2. Decorator's Techniques

The range of nineteenth-century decorating techniques was as extensive as the imagination allowed. Nevertheless there were certain principal techniques which formed the basis of all schemes of painted decorations. They included the *faux* finishes, stencilling and gilding.

Graining and Marbling

Graining, or painted imitations of various types of woods and marbles, was a feature of decorative painting throughout the period of this study. The aim of graining was not to have the imitation mistaken for the genuine material but rather, as J.C.Loudon reminded, to give a richness greater than the effect of plain colour.

> *All woodwork...should...be grained in imitation of some natural wood; not with a view of having the imitation mistaken for the original, but rather to create allusion to it, and, by diversity of lines and shades, to produce a kind of variety and intricacy, which affords more pleasure to the eye than a flat shade of colour.*[32]

Graining was intended to also conceal from view the inferior timbers, particularly imported softwoods. These lacked the fine appearance of noble timbers such as English oak, mahogany, elm or chestnut. In Australia, where there was no indigenous oak suitable for cabinetwork and joinery, fine local joinery timbers such as cedar, were initially grained in imitation of English oak.

The method of execution of graining gave it the alternative name of 'combing' which described the process of dragging combs of various types through the wet paint to produce the effect of the timber grain. Graining in water-based, spirit-based or oil colours was given a coat of protective varnish, often as used in the polishing of the genuine timber joinery being imitated.[33]

---

[32]J.C.Loudon, Encyclopaedia, Cl.577, p.277.

Since graining was a specialised class of painting in which plausible imitations of all the exotic timbers could be produced, some painters chose to specialise in this work alone. The resulting abundance of sumptuous graining and marbling late in the nineteenth century was consistent with the generally more indulgent approach to decorations in the closing decades of the century.

Stencilling

The extensive use of stencilling was characteristic of the development of interior house-painting in the nineteenth century. Stencilling provided the vehicle for much of the artistic achievement in late nineteenth-century decorative painting. It was a principal feature of decoration in the Gothic Revival, and the Art and Aesthetic movements, in which it was often used to fill large expanses of flat and moulded surfaces. Stencilling provided the means of adding flowing sinuous forms in delicate linework to flat surfaces during the later periods of *Art Nouveau* in Britain, and Federation in Australia.

Stencilling was an ancient form of painted decoration which was re-introduced by British house-painters as a cheap substitute for wallpaper around 1830. The process at that time did not have a high reputation, being described by the derogatory name of 'slapdashing'. It was commonly applied in three or four colours to imitate wallhangings which were considerably more expensive at the time.[34]

Nathaniel Whittock placed stencilling near the bottom of the hierarchy of painting techniques:

> *Stencilling is the cheapest and most expeditious method of decorating rooms, and is always done in distemper colours. All the pigments that will grind in water may be used in this process.*[35]

[33]The term 'polish' was an abbreviation for 'French polishing', the process of applying stains, varnishes and waxes to achieve a rich finish on joinery and furniture. In common use the term referred to a range of clear coatings.

[34]The Journal of Decorative Art, July, 1884, pp. 541-542.

However stencilling provided Victorian designers with a vehicle for producing the illusion of wall tiling, ashlar and many exotic wall fabrics. A wide range of decorative stencilling was perfected by D.R.Hay and his circle of skilled painters. From pragmatic beginnings the art of stencilling developed into a full decorative style to complement the developing range of furnishings and decorations and its ultimate importance was acknowledged:

During the last few years the demand for elaborate decoration of both public and private buildings, and the advance in the cost of skilled labour, have together contributed to bring to perfection the use of the stencil-plate for decorative work; ...it has retained and increased its hold on the trade , and scarcely a job of any sort is now finished without its aid.[36]

The process was simple. Overall patterns were produced by the repetitive application of ornamental stencil patterns. Decorators prepared their own stencils from paper prepared with varnish.[37] The stencil patterns were applied with purpose-made, stiff, bristle brushes. For overhead work and the decoration of flat ceilings painters also used felt covered printer's rollers to apply the paint.[38]

The subtleties which contributed to the artistic results of late nineteenth-century stencilled decorations were noted by J.Moyr Smith in his monthly journal, Decoration:

One of the greatest advantages of stencilling in decoration is that it imposes upon the designer conditions which oblige him to design his ornament in the flat and conventional style to which only it can give utterance... On distemper, undoubtedly the best form in which to apply the colour, is to mix it with turpentine

[35]Nathaniel Whittock, The Decorative Painter's and Glazier's Guide, p.188.

[36]Decoration, October 1885, pp.55-6.

[37]The usual method of preparing stencil paper was to soak cartridge paper in boiled linseed oil thus rendering the paper translucent and rigid when dry.

[38]It is known that some stencilling was undertaken by using a small printer's roller. This was particularly well suited to work on flat ceilings. However the major part of stencilling work was executed with a stencil brush.

and japanner's gold size ...which does not run...on a flatted ground , half-and-half colour or oil colour works the best...on an oil ground , flat colour is cleanest in using and works better than oil... on gold ground, a little japan size in oil colour gives body to the work and makes it cleanly. Varnish colour also works well on gold. All gold grounds must be sized before working on.[39]

The arrival of good alternative wall finishes, such as Lincrusta and leather paper,[40] contributed to the demise of stencilling.[41] The popularity of these manufactured finishes prompted Moyr Smith to agitate for a re-appraisal of sophisticated stencil techniques like imitation damask.

A well-flatted wall, diapered with an arabesque or fabric pattern in varnish with which a little staining colour has been mixed, has a good "satin" effect, and if the depth of colour is judiciously varied from a fairly prominent self-tint to a scarcely visible sheen - the gradation extending over the whole panel evenly in a diagonal direction - it greatly adds to this old-fashioned but rather pleasing deception.[42]

The art of stencilling was developed to a very high standard in interior decorations in England, Scotland and Australia. The technique appealed to the decorative artists who appreciated the level of control and the ultimate flexibility they could maintain over their work.

Gilding

The application of gold leaf to selected surfaces, known as gilding, was used in decorative schemes to enliven the decoration and provide relief from flatness. Gilding, like stencilling, was a straightforward mechanical process.

---

[39] Decoration, November 1885, p.69.

[40] The leather papers like Rottmans and Lincrusta were manufactured by a process of pressing paper pulp to form an embossed finish which could be supplied with a decorative treatment or it could be coloured by unskilled painters. These papers gained immediate popular appeal.

[41] Decoration, November 1885, p.84.

[42] Ibid.

Gilding took two forms; burnished (water gilding) or matt (oil gilding). The process of water gilding involved the application of gold leaf to a foundation of coloured bole which facilitated burnishing. The matt leaf could be burnished to achieve a bright lustre on architectural details and was therefore well suited to the gilding of ornamented areas, especially mouldings and frames.

The process of oil gilding did not lend itself to burnishing, however it was simpler to apply in architectural decoration, the leaf being simply laid onto a tacky surface of oil mordant. Oil gilding could be applied to flat, moulded or textured surfaces.

As a general rule gilding was applied to projecting convex surfaces to ensure the greatest opportunity for the gold to relect light. On flat surfaces the nineteenth-century practice was to gild onto a textured substrate.[43] Paper, woven fabric and sanded surfaces were preferred.[44]

The cost of gold leaf was sometimes a determining factor in its use. Decorators found plausible cheap substitutes in bronze powder like that manufactured by Bessemer, which found favour from the 1880s onwards.[45]

Handpainting

Handpainting was used with greatly varying results. It had the advantage of being very fast when undertaken by skilled painters and having subtle irregularities which offset the mechanical uniformity of stencilling. With an adequate viewing distance handpainting could be readily substituted for stencilling even in repeating patterns.

[43]See *figs 124, 126 and 127*. It can be observed that the gilding was applied to moulded surfaces and textured surfaces of paper, fabric and sand.

[44]Sanded substrates were prepared by simply dusting the first coat of tacky gold size with fine sand before applying a second coat of size onto which the gold leaf was then applied.

[45]The German manufacturer, H.Bessemer patented a method of producing a gold paint composed of a bronze powder and lacquer.

The more skilful decorators favoured handpainting as Andrew Wells emphasised in a public lecture he delivered in Sydney in 1892:

> *I have painted many of the finest houses in Scotland ... the ceilings being entirely decorated by hand with figures, wreathes, and ornamental compositions, the walls also being decorated with the like specially designed and hand-painted ornament. This is the most artistic manner, and no two houses are ever painted in the same way.*[46]

Elaborate and detailed handpainting of scenes, portraits or other compositions was sometimes done in the studio on a fabric support which was later applied to the architectural surface by means of a bonding coat of white lead in oil or a patent mastic. Scottish decorators took advantage of the enforced curtailment of their on-site work during the winter months to train their apprentices on the handpainting of canvasses which were then applied to the walls of their commissioned works in the new season. This method saved valuable time on the worksite.

Setting Out

Successful decorative painting depended to a large extent on accurate setting out. The point was emphasised in trade manuals and published articles, some of which detailed the steps to be followed in preparing and executing a decorative scheme.[47]

Starting with a design prepared in the studio, the first step was to verify the squareness or trueness of, say, the ceiling, and then to find its centre by striking chalk lines from the corners. A tack driven in at the centre then acted as a fulcrum for string lines which were used to describe, say, the ellipse or central circle. The next step was to paint the grounding colours within the setout. The order of application commenced with the inpainting of the centre, then the corners and lastly the perimeter

[46] Australian Builder and Contractors' News, May 7, 1892, p.323.

[47] The Journal of Decorative Art, April 1891, p.60, May, p.67 and June, p.89.

band. The stencils were usually prepared while this process of applying the grounding and flatting was taking place. The work was completed with the stencilling.

Models and Design Drawings

Many, if not most of the decorators, prepared hand-coloured scale drawings to convey the full intent of their design proposals to their clients. A number of beautifully prepared water colour sketches of decorative schemes by some of the most important firms of decorators survive as evidence of this practice.[48]

It is likely that the preparation of the model drawings occupied a considerable amount of the time of the principal designers since it was a task which could hardly be delegated. In the Lyon and Cottier folio of surviving design papers a large proportion of the designs are stamped 'Accepted Design' with the price marked in sterling. It appears therefore that the drawings were retained for contractual purposes.

With the acceptance of the model drawings it is likely that the decorators then prepared colour sample boards also for the benefit of the clients, however until recently none were known to have survived; a fact which suggests that they were large and insubstantial.[49] A palette of painters colours recently discovered in a New South Wales country residence (*fig.128*).[50] It had been painted onto an accessible service wall and it is probably indicative of the sample panels prepared by decorators.

[48]See *figs 51, 58, 59, 68, 69, 94, 102, 104 & 105*. Comprehensive sets of drawings survive from the decorators, Heaton, Butler and Bayne; Lyon, Cottier and Company and J.Ross Anderson. These examples of decorator's drawings are representative of the usual form of proposed design models.

[49]In the work described in case studies 4-6 it was found necessary to prepare model drawings and sample palettes to fully explain intentions to the clients. Discerning clients last century would not have accepted less.

[50]A sample palette of paint colours was recently discovered in a New South Wales country residence, 'Tahlee', near Newcastle.

3. Substrates

Painted decorations were applied to a wide variety of surfaces, or substrates. The greatest proportion were applied to plaster ceilings or walls, in conjunction with timber joinery. However, many other interior building surfaces, including stone, metal and glass were also decorated. The decorations were most usually applied directly to these surfaces by house-painters and decorators working from trestles or scaffolding to gain access to high areas.

Painted decorations were also applied to an intermediate surface, such as paper or canvas, in the studio or on site. The choice of an intermediate support fabric was influenced by the need to improve the surface to be decorated or, to enable the painter to work off-site.

Plaster

Nineteenth-century plasterwork was applied in three or more coats. The first (scratch) coat of lime and sand plaster, called the render, acted as a levelling coat to take out the uneveness of the wall or ceiling. The main coat, composed of lime and sand with an amount of cowhair or straw, gave the wall its even finish. The final finish coat of lime, plaster of Paris or gypsum, called the 'set' was always trowelled to a very smooth finish to receive the paintwork. The whole process involved the use of a great deal of water and, in the case of the lime, materials which were slow to set. Hence the painting could not follow too closely after the plastering.

After the necessary period of drying a preparation of some sort was required to offset the high porosity of the plaster and sometimes also to overcome its agressive alkalinity. The problem of porosity was significant in distempering, which required a preparation with

clairecolle[51], a coating of unpigmented size to which a little alum was added. This filled the pores and provided an ideal surface over which the distemper would flow without forming dead patches.

Oil paint was applied in five coats to achieve a quality finish on plaster. The first two coats were composed of white lead and linseed oil with a small quantity of litharge. The intermediate coats were mixed to the consistency of a good durable oil paint and the last coat was mixed with turpentine and gold size to achieve a flat finish. *Clairecolle* was also used selectively as a preparation coat for oil paint.

Wood, Stone and Metal

Nearly all surfaces other than plaster were painted in oil. Conventional oil paints were applied to timber joinery, metal and stone masonry.

The procedure for preparing and painting interior woodwork commenced with the recommendation to apply a knotting to the wood.[52] The function of the 'knotting' was to bind in the resinous sap which would otherwise bleed through the finished paintwork. After the knotting a priming coat of white lead and oil, or red lead and oil, or the two together would be applied. Its function was to fill the pores of the wood before the application of the colouring coats. The second, third and fourth coats in oil were coloured up to the required finish.

If the intended finish was to be glossy this was achieved by rubbing with pumice between coats to produce a very even surface. If the finish was to be flat, the turps-rich

[51]The term *clairecolle* derived from the French *claire colle*. In Australia and Britain, this term was debased to 'clear cole' or 'clearcole'.

[52]The Science and Art Depatment of the Committee of the Council on Education, South Kensington. Notes on Building Construction, 1883, Chapter XXIV, 'Painting, Paperhanging, Glazing, p.411.

flatting coat would be stippled over a lightly rubbed surface. Flatted surfaces were preferred for most decorative work (*fig.129*).

Face stonework was also encountered as an internal surface to be painted and decorated. Where it has been possible to research the finishing technique it has been found that the stone was prepared with white lead as a priming coat, the same method as used for metals, such as cast iron architectural members and zinc organ pipes.

In some English church work decorations were painted onto thin sheet zinc. In St Bartholomew's, Sutton Waldron,[53] the curved undersides of the hammerbeam brackets are decorated with stencils applied in oil to flat strips of zinc which were tacked to the wooden surfaces.

In Australia, the use of pressed zinc, iron and steel sheet became popular in the 1880s. Colour was applied to the material in thin coats of oil paint and occasionally stencilling was applied over the embossed patterns of the metal (*fig.86*).[54] Pressed metal sheets left the factory either coated with linseed oil or fully pre-painted. The manufacturers recommended that following installation the metal should receive a coat of pure white lead or zinc oxide ground in oil, to which turps and driers should be added. A second, tinted coat and final coat of the same could then be tinted to the final desired colour.

Canvas and Linen

Given the universal use of canvas and linen as supports for easel paintings it is not surprising that these supports were used also for painted decorations. It has been noted that David Hay had his men paint onto canvas in the paint shop during the winter months as a means of

[53]Case Study No 8.

[54]See 6.4.2. Phil Goatcher designed and decorated pressed metal in Sydney.

keeping them productive in the off-season. Walter Crane observed that:

Even Madox Brown, who used Gambier Parry's method of spirit fresco for his early panels at Manchester, considered that painting in flatted colour on canvas, and having the picture fastened down on the wall panel with white lead, on the French plan, was quite as good for mural work.[55]

It was believed by some that oil colour should not be applied directly to plaster because the lime in the plaster destroyed the oil, taking away the freshness of the finish. To get around this problem some artists of the early nineteenth century worked on canvas which was then fixed to frames in-situ. The pasting method preferred by Hay was similar to that described by Baldry:

The wall was first plastered solidly and smoothly...then...a stiff mixture of white lead and strong varnish, and on to this preparation the canvas is pressed with rollers or large bladed steel knives until it firmly adheres in every part...the lead and varnish harden into an impervious mass which holds the canvas firmly, and guards it from damp from behind.[56]

Canvas was prepared by the application of white lead in oil applied with a trowell. Quality canvas was made from pure flax and fully primed with two coats of glue size and three coats of oil colour, the last one flatted.[57]

Linen was used in much the same way as canvas. Indeed Frederick Crace had his painters Lambelet and Jones paint *chinoiseries* for the Brighton Pavilion in 1822 in oil on a light fabric such as linen. Lyon and Cottier used linen as a substrate for painting the decorations of the ceiling

[55]Walter Crane, 'On the Decoration of Public Buildings', a lecture given to the Arts and Crafts Exhibition Society, London, Autumn 1896.

[56]A.Lys Baldry, Modern Mural Decoration (London: George Newnes) 1902. Pp 36-46.

[57]Rosamund D. Harley, "Artists Prepared Canvases from Windsor and Newton, 1928-1951", Studies in Conservation, Vol. 32, No 2, May 1987.

to St Andrews College Library at Sydney University in the 1870s (*fig.130*). The latter was lined with softwood deal boarding over which the linen was tacked. It is believed that these decorations were painted in-situ in distemper.

Similar methods were used in other situations where internal linings of grooved boards were to be decorated. During quiet times in England decorators prepared hand stencilled friezes on jute fabrics and other materials in the paint shop so that they could be ready when the orders came in during the following busy period.[58]

Paper (including Lining Paper)

Paper supports of various kinds were used in decoration. They offered some advantages over other fabrics, being lighter, cheaper and variable in texture. Most commonly cheap lining papers were chosen as a support to provide a consistent substrate for high quality decoration.

Technical manuals recommended the use of lining paper as a foundation for high quality work, especially work undertaken in distemper on poor quality surfaces.[59] Site research undertaken in Sydney and Melbourne for this study confirms that a high proportion of painted ceiling decorations were applied onto lining paper, applied in the same manner as conventional wallpapers (*fig.131*).

The recommended practice was to apply a sharp priming coat of oil paint thinned with turps over the sized lining paper in preparation for oil colour or distemper.[60] This hardened the surface for the initial painting. The method ensured that walls or ceilings could be ready for painting in a shorter time than naturally cured plaster.

---

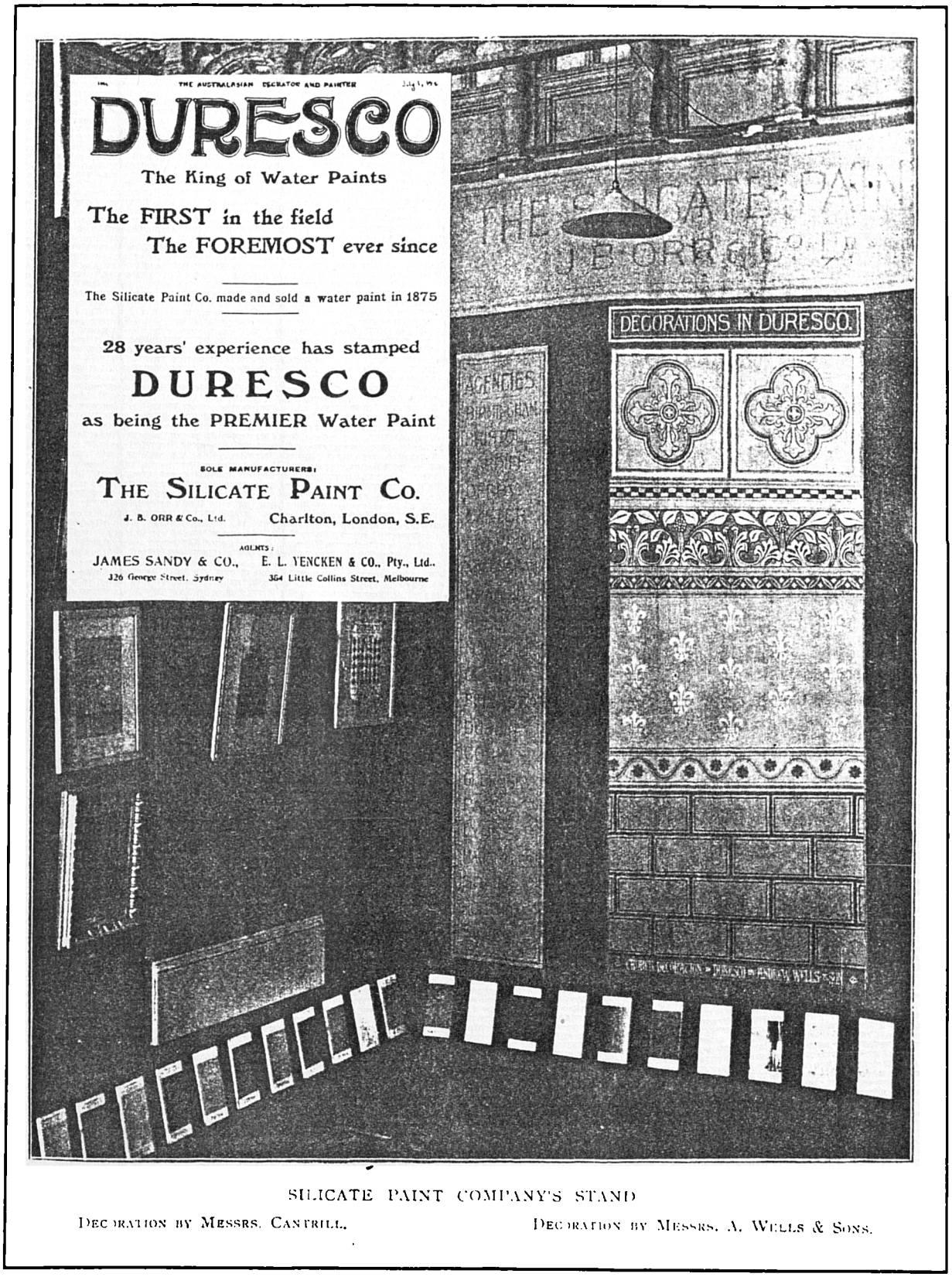
[58] The Australasian Decorator and Painter, 1 January 1907, p.95.

[59] The Journal of Decorative Art, March 1885, p.661.

[60] The Journal of Decorative Art, March 1894, p.62.

Fig. 123
Detail of the spirit fresco painting of 'the Last Supper' by Lord Frederick Leighton, PRA in St Michael's and All Angels, Lyndhurst, Dorset.

Fig. 124
Detail of ceiling decorations in the residence of Sir George Verdon, Collins Street, Melbourne, 1887. The decorations by Andrew Wells feature gilding over a sanded ground to give life to the gold.



SILICATE PAINT COMPANY'S STAND

DECORATION BY MESSRS. CANTRILL. DECORATION BY MESSRS. A. WELLS & SONS.

Fig. 125
View of a display stand presented by the Silicate Paint Company with examples of 'Duresco' decoration prepared by Messrs Andrew Wells and Sons of Glasgow. The Journal of Decorative Art, November 1896. The advertisement for Duresco appeared in The Australasian Decorator and Painter, 1 July 1906.

Fig. 126
Detail of the ceiling of St Finn Barre's Cathedral, Cork, with decorations by Campbell Smith to the design of William Burges.

Fig. 127
Detail of wall decorations designed by William Burges in the library of Cardiff Castle. The design motifs drawn from a variety of sources including Japan and the Eastern World, are painted in part onto textured paper.

Fig. 128
Painted palette of colours in 'Tahlee House', NSW (circa 1880), believed to be sample colours which were brushed out by a decorator to indicate the finishes to be used in decorations.

Fig. 129
Decoration by Clayton and Bell to organ pipes in St Nicholas, Silton, Devon. The gold is contrasted with flatted Indian red colour on the wooden pipes.

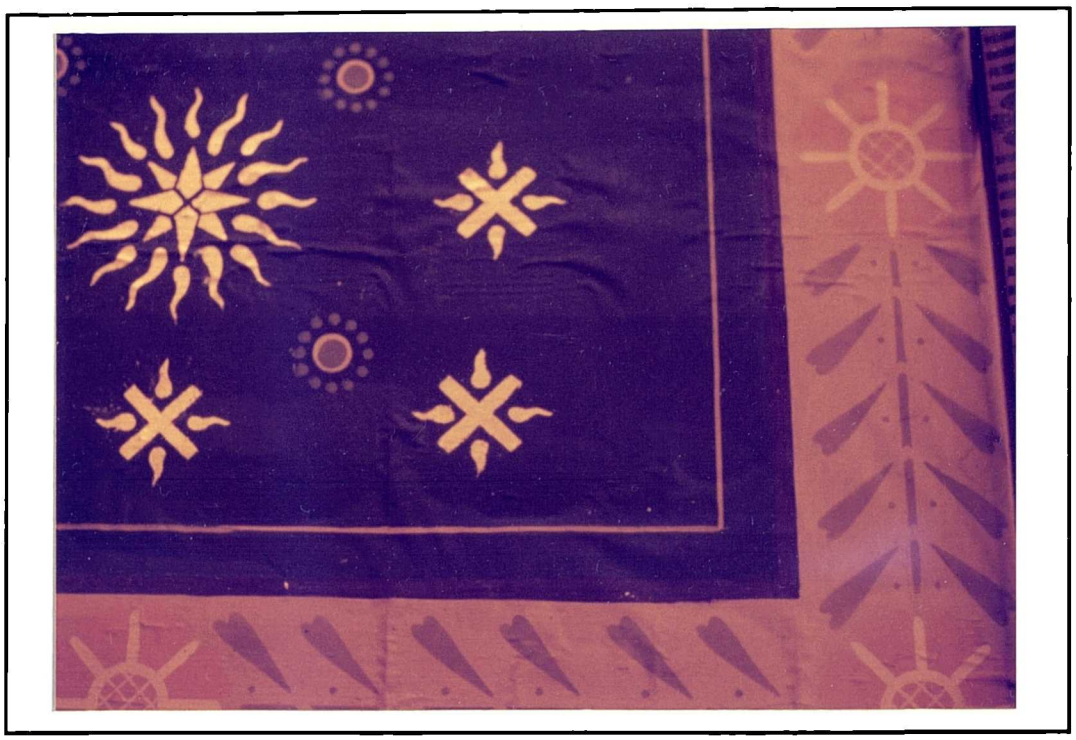


Fig. 130
Ceiling decorations in St Andrew's College, Sydney University, decorated in 1875 by Lyon, Cottier and Co. The decorations are painted in distemper onto a linen ground which is fixed with tacks to the boarded roof lining.

Fig. 131
View of the ceiling of the Drawing Room in 'Villa Alba', Melbourne, decorated by the Paterson Brothers, 1884. The decorations were painted onto lining paper over plaster. The loss of adhesion reveals the method used.

APPENDIX B
NOTES ON COMMON CAUSES OF DETERIORATION AND FAILURE

1. Causes of Deterioration

The preservation of painted decorations is dependent on the stability of the paint film, atmospheric conditions and the condition of the substrate onto which the decorations have been painted. It is an accepted fact that paints and varnishes begin to deteriorate from the day they are applied[1] and, since the majority of nineteenth-century house-paints are organic substances which deteriorate through reaction with the practically unlimited supply of oxygen in the atmosphere, the process of deterioration is largely unavoidable. However, physical and environmental factors can be managed in a way which facilitates preservation.

A stable environment is a pre-requisite. Most organic materials can be preserved in a stable environment of around 55% relative humidity at 20°C. The condition of painted decorations can remain unchanged in such an environment. However it is known that the conditions within buildings do change in direct response to exterior conditions and internal activities.

Organic paint films and their supports constantly expand and contract, sometimes differentially, in response to fluctuations in temperature and relative humidity. Furthermore air pollutants affect the condition of both organic and inorganic materials. Amongst these different influences there are some common causes of deterioration which need to be understood as a pre-requisite to developing conservation strategies.

---

[1]Robert L. Feller, 'Deterioration of Organic Substances and the Analysis of Paints and Varnishes', Preservation and Conservation: Principles and Practices (Williamsburg and Philadelphia, 1972).

Damp

Damp is the prime mover in most deterioration processes.[2] In combination with other factors, damp can cause damage such as the disruption of plaster substrates and paint films.[3] The main sources of damp are water vapour, from the atmosphere, rain water, condensation and ground water.

Water passes in and out of porous building materials in either a liquid or vapour state. Materials take up or release moisture to remain in equilibrium with their surrounding environment. Organic paint films allow the passage of some water or water vapour and this water is a vehicle for salts which can disrupt the paint film and cause it to become detached from the substrate.

When a paint film is broken, the process of flaking will proceed rapidly as a result of the loss of vacuum bond[4] between the paint film and the substrate (*fig.132*). Therefore painted decorations are unstable and vulnerable on surfaces through which water is either absorbed or lost, or if they are lying on a substrate which becomes affected by moisture. The presence of excessive moisture in a porous substrate can lead to disruption of the paint film and, ultimately, severe flaking.

A different form of failure is observed with painted decorations on a damp substrate of limited porosity, such as the clay-rich plasters of early colonial buildings in New South Wales. In these situations the paint film can

[2]The term 'damp' describes the condition of dampness or high humidity, a condition which affects porous building materials.

[3]Pamela M. Pratt, 'The Deterioration of Wall Paintings', conference paper read to I.I.C. UK Group, on the subject of 'The Conservation Of Wall Paintings', 25-26 March 1976.

[4]Paint is rarely bonded to the substrate by any physical means other than by vacuum. In other words, the exclusion of air from under the paint film is all that prevents the continuous paint film from falling off surfaces such as plaster walls and ceilings under the effect of gravity.

dry and contract on the still damp substrate as the room or surrounding environment dries out when rooms are heated by artificial means. The contraction of the paint film results in crazing and then, following the disruption of the continuity of the paint film, flaking occurs.

When a continuous layer of paint is subjected to change differential to its substrate there will be a resulting stress which will eventually lead to failure. The stress might be caused by changes in the immediate environment or by physical factors. In one illustration of the last-named, superimposed wallpaper caused damage to underlying painted decorations (*fig.133*). The removal of the overlying paper from the unstable painted decorations resulted in unacceptable paint loss.[5]

Deterioration caused by damp is often accompanied by chemical activity arising from the presence and migration of acids and alkaline salts. Damp-induced chemical activity is commonly observed in areas where water enters a building around windows and in corners, conveying soluble salts whose origins are atmospheric pollutants or the masonry building fabric itself (*fig.134*).

A problem common in churches and buildings which are subjected to intermittent heating is condensation. Moisture from condensation can take up air pollutants and surface deposits, resulting in the formation of acid or alkaline substances which can affect a paint medium and some pigments. It can be especially damaging in buildings where seasonal temperature differences between the interior and exterior are very pronounced.[6]

[5]In the former residence of Samuel Lyons (now the Domremy Convent) the walls of the main rooms were painted early this century to provide light, uniformly painted room interiors for educational purposes. The painted decorations by Lyon, Cottier and Co. were covered with lining paper prior to the painting. With seasonal changes the overlayer of paint and paper expanded and contracted with changes in relative humidity in the room causing significant loss of the original paint film along the vertical joints of the lining papers where the movement in the paper was most pronounced.

[6]Nils Marstein and Mille Stein, 'Advanced Measuring of the Climatic

Action of Salts

Salts are readily taken into solution in the presence of moisture. In the liquid form they can move freely through porous building fabric to emerge in areas where decorations are present. These salts do not normally present a problem while they are in solution, however when they change from a liquid to a solid state there is a growth in their volume which produces expansive forces sufficient to disrupt paintwork.

The presence of the salts is first noticed as a white salt efflorescence on the paint film, usually in the area of a film breakdown (*fig.135*). The migration of soluble salts, and their crystallisation upon drying on or near the surface of building fabric, constitutes a principal cause of break-down in impervious paint films. The problem compounds during normal seasonal cycles of wetting and drying with changes in humidity.

Most salts are hygroscopic and will readily take up moisture from the atmosphere during periods of high relative humidity. Thus damage will result from even a minor cycle of fluctuating humidity. In old buildings with porous masonry walls and a heavy paint build-up, the paint can act as a sacrificial coating, absorbing salts in solution and breaking down into powder under the force of crystallisation of the drying salts.

Salts can originate from several sources. In coastal areas, aerosols[7] (composed of mainly sodium chloride) driven by sea breezes present a significant problem. In poorly maintained buildings salts deriving from a polluted outdoor atmosphere can enter the porous masonry via cracks

Conditions in the Mediaeval Wooden Churches in Norway', paper presented to the 8th Triennial Meeting of the ICOM Committee for Conservation, Sydney, Australia, 6-11 September 1987.

[7]The aerosols consist of colloidal particles of mainly salts from the ocean dispersed in the atmosphere.

in exposed walls, on parapets and around openings. These are transported in solution to an interior surface where the water can evaporate and the salts then crystallise out as an efflorescence.[8] The degree of damage caused by salts is related to their composition, the degree of porosity and pore size of plaster substrates and the permeability of the paint film.[9]

The types of salts most commonly found on wall paintings are phosphates, nitrates, sulphates, carbonates, silicates and chlorides. The salts which are considered the most dangerous to painted surfaces are the sulphates of sodium, potassium, magnesium and calcium. The lastnamed can form a white veil over a painted wall surface or it can crystallise in the plaster beneath the surface of the paint causing severe surface disruption. The nitrates of sodium, potassium and calcium are the soluble salts which normally give rise to thick unsightly white efflorescences

During the nineteenth century, when gas lighting produced high levels of condensation which fixed airborne dust emanating from the burning of fossil fuels, this provided a continuing source of salts. When the same rooms were heated intermittently condensation formed on cold wall surfaces and provided the vehicle to concentrate these salts on the painted surfaces, resulting in significant deterioration.

Salt damage also occurs in buildings which do not have adequate damp proof courses. Rising damp creates a noticeable 'tidal' zone on ground floor walls indicating a vulnerable area where moisture bearing salts have risen to a level whereby they dehydrate and crystallise. This 'tidemark' rises and falls with seasonal changes resulting

[8]Pratt, 'The Deterioration of Wall Paintings', pp.4-5.

[9]Porous materials such as the distempers readily absorb or give off moisture. Old low gloss oil paints can behave in a similar manner. Old high gloss paints which were formulated to be rich in oil sometimes form a continuous film which is only slightly impervious to moisture.

in a breakdown of the wall surface finish in a horizontal zone.

Salt activity can occur equally on ceilings where condensation is pronounced; and in room corners below ceilings where moisture from above usually concentrates at the junctions of walls and ceilings. In such cases the problem must be addressed at the source.

Atmospheric Pollutants

Atmospheric pollutants can emanate from both natural and artificial sources. Carbon dioxide, sulphur dioxide and sulphur trioxide are the three pollutants which cause most damage to painted decorations on plasters containing lime.

Carbon dioxide occurs naturally as a non-toxic constituent of the atmosphere. It is also a product of the respiration of human beings. Carbon dioxide combines with water to form dilute carbonic acid which readily dissolves calcium carbonate in plasters and reforms as calcium carbonate crystals on painted surfaces.

Sulphur dioxide and sulphur trioxide are produced by the combustion of fossil fuels. Sulphur dioxide is readily oxidised to sulphur trioxide which combines with water to form dilute sulphuric acid. The acid reacts with the free calcium carbonate of plasters to form gypsum salts which contribute significantly to the destruction of painted surfaces due to the high growth rate of the crystals.

Sulphuric acid also attacks organic media such as animal glues, casein and egg, causing some size-based paints to fail by flaking. Lining papers fail due to embrittlement of the glue size with a resulting loss of adhesion.[10]

[10]See *fig.130*. In this illustration the common practice of applying the painted decorations onto lining paper was followed. The lining paper has become detached from the plaster substrate, probably due to failure of size.

Natural aerosols are atmospheric pollutants which derive from natural sources and from ground and water pollutants. The particles which comprise the aerosols are so minute and light in weight that they remain in suspension in the air and invade indoor environments. They commonly contain fine silica and calcium carbonate from the ground and chlorides and sulphates of alkali metals from the sea.[11] Artificial aerosols in towns and cities contain particles whose source is combustion. These settle on painted surfaces and combine with other agents to affect paintwork. However damage can be avoided through regular cleaning to remove deposits from painted surfaces.

Biological Activity

Painted surfaces are not abnormally vulnerable to deterioration arising from biological activity although significant problems arise in some circumstancea. The growth of micro-organisms such as fungi is an everpresent threat to painted surfaces in areas of high relative humidity. It is common to find stains and spots of fungal growths on areas of decoration which experience relative humidity above 65%. Fungal growths can behave in the same manner as salts, disrupting the continuity of a paint film by the forces of growth. The fungi can be so small that the holes they create are not visible to the naked eye, although the nett effect can be a colour change in an area of painted decorations or even destruction of the paint film. The control of this problem is dependent on control of the conditions which promote fungal growth.

In one example of fungal attack, unsightly damage was sustained to painted decorations on the ceiling of the roof of a church due to fungal growth on the surface of the plaster where oil colour stencils had been applied to a self-coloured plaster and then fixed with a clear varnish.[12] As a result of the build-up of trapped

[11]Mora, Mora and Philippot, Conservation of Wall Paintings, p.184.

[12]See Case Study No.10. The parish church of St Issey, Cornwall.

moisture in the plaster and the development of ideal conditions for fungal growth, a fungus developed under the varnish, showing as black spotting over the entire surface of the plaster ceiling (*fig.136*).

In Australia, the warm conditions are ideal for the growth and development of a variety of biological organisms, including insects and animals. In particular fungi, termites and possums cause damage to painted decorations.

Termites are extraordinarily voracious predators and are known to destroy almost all materials which fall in their path, although they feed mainly on the cellulose matter of wood. The most obvious manifestation of their destructive power is seen in the failure of lath-and-plaster ceilings and walls where termites have been known to destroy timber laths completely. Termites also build nests which impose loads on walls or ceilings bringing about early structural failure. The surface tunnels, which they build to bridge external surfaces, are damaging to paint finishes. In extreme situations termites will eat paint.

Possums cause damage in cities like Sydney and Melbourne where they have reached plague proportions. They are nocturnal animals and therefore seek to nest in the dark roof spaces of buildings where their activities cause severe damage to plaster and pressed metal ceilings in particular. The urine which they excrete in abundance is extremely damaging to most surfaces. Buildings as significant as the New South Wales Houses of Parliament have suffered serious damage to important finishes from these common pests.

Sunlight and Darkness

Sunlight and all other forms of light which are high in the ultraviolet wavelengths will cause damage to paint

finishes. Light fades organic pigments and causes hardening and embrittlement of organic binding media due to accelerated oxidation and crosslinking. Darkness also has an effect on some paint finishes by darkening the vegetable drying oils.

The embrittling effect of sunlight is first observed around window and door openings where the light breaks down finishes, particularly those which are low in pigment and rich in oil. The effect is first noticed in the bleaching of the paint, closely followed by cupping and flaking.

The pigments which are most vulnerable to light are those derived from organic sources such as the lakes and dyes. However many of the inorganic pigments, including some of the commonly used decorators colours, are also subject to change when exposed to light in the ultraviolet and near-ultraviolet wavelengths. Chrome yellow has been mentioned as a pigment which loses chroma and even darkens with age. Vermilion is also known to darken when exposed to direct sunlight.

A problem known to easel painting conservators is the darkening of some paint finishes in very low light levels. Paints containing vegetable oils slowly turn yellow-brown in darkness.[13] House-paints containing a large proportion of linseed oil have turned brown in the absence of light, a problem which can be significant with light tints. However the true colour can be recovered by submitting samples to the bleaching effect of sunlight or artificial ultraviolet light.[14]

---

[13]Morgan W.Phillips, 'Discoloration of Old House Paints: Restoration of Paint Colours at the Harrison Gray Otis House, Boston', Paint Colour Research and Restoration of Historic Paint, APT Publication Supplement, 1977, pp.14-22.
[14]Ibid.

Changes in Temperature

Fluctuations in temperature, it has been noted, can cause damage to painted decorations executed in the organic oil medium with a relatively high coefficient of expansion. The cycle of expansion and contraction weakens the integrity of the paint film and also its bonding to the substrate. When the cycle of expansion and contraction is significant the paint eventually becomes detached.

Draughts and Wind

Draughts and breezes deposit pollutants on painted surfaces and cause uneven drying of damp fabric.

Draughts move air-borne pollutants from the external environment to building interiors, depositing them on painted surfaces where they can combine with moisture to cause damage.[15] The movement of dirt and other airborne pollutants closely relates the draughts and air currents in building interiors.[16]

The rate of crystallisation of salts also relates directly to air movements. Accordingly there is a direct relationship between draughts and salt damage to painted surfaces. The cycles of wetting and drying of salts, and therefore the damage caused by the salts, is most noticeable in the areas of greatest air movement.

---

[15]An extreme example of the effects of draughts was observed in a project undertaken in 1985 to restore the painted decorations in the chapel of the Marlborough School, Wiltshire, where a scheme of decorative painting by Clayton and Bell was cleaned and consolidated by Peter Larkworthy and his team of assistants. The layers of dirt on horizontal ledges high up in the nave were several centimeters thick.

[16]For one hundred years the small entrance doors to this chapel located at the west end had served as the only entrance to worshippers. When scaffolding was erected to give access to the roof it was possible to observe that the build-up of dirt and dust on all high level horizontal surfaces was heaviest at the west end, nearest the doorway, and that it tapered off to only a relatively light build-up at the east end where air movement was slight.

Conversely, damp walls and ceilings are very slow to dry when there is no air movement. When condensation is present, the moisture of condensation can be slow to dry out in areas where there is no air movement, such as at the junctions of walls and ceilings. The effect can be observed in the colour differences between the paintwork on the damp areas and the drier surfaces.

Oxidation

Oxidation, the act of combining with oxygen (or any electro-negative element or radical such as chlorine), has the effect of degrading painted surfaces by blanching or chalking. The process causes fading of the apparent colour of paint by degrading oil media, thus reducing gloss level and causing diffusion of incident white light from the paint surface.[17] The exposure of paint to near ultraviolet light speeds the process of oxidation.

Ozone, an air pollutant in urban environments, is a powerful oxidant which adversely affects some organic pigments. Indigo, lac lake and madder lake have been found to be sensitive to ozone exposure.[18] Since only a small number of the sensitive pigments are commonly found in painted decorations the problem is minor. However it is an issue of increasing concern due to the increase of ozone-producing photochemical smog in most cities and the use of ozone in air conditioning.

---

[17]Ruth M. Johnston and Robert L. Feller, 'Optics of Paint Films; Glazes and chalking', paper presented to the seminar, 'Application of Science in Examination of Works of Art', Boston, Museum of Fine Arts, 1965.

[18]Paul M. Whitmore and Glenn R. Cass, "The Ozone Fading of Traditional Japanese Colorants", Studies in Conservation. Vol 33, No 1, February 1988.

2. Causes of Failure

Painted decorations fail in a number of ways, mostly due to the presence of water, salts, pollutants or sunlight; or because of the fluctuations in temperature and relative humidity as described. Paint films can break down and cup, flake, chalk or undergo other forms of degradation due to the action of fungal growth or physical damage. Of all the usual forms of failure the most common is flaking.

Flaking occurs when a paint film ceases to be continuous over a surface and there is loss of bond between the paint film and its substrate, accompanied by the embrittlement of the paint film. Once the surface is broken the paint film shrinks away from the point of the break. The resulting stresses in the paint film cause a distortion of the film, usually in the form of cupping. Once it has begun the process is self-generating.[19]

Flaking can result from the growth of salts. The forces of expansion of the dehydrating, crystallising salts is sufficient to erupt the paint surface and cause disruption of the continuity of the film. The hygroscopic nature of many salts has the effect of raising and lowering the moisture content of paint film greater than adjacent atmospheric fluctuations. The cycles of change result in excessive growth and contraction of permeable paint films which leads to further paint losses and flaking.

Fluctuations in temperature sets up cycles of expansion and contraction which lead to flaking. The intermittent use of heaters, strong lights and the daily cycles of sunlight penetration cause expansion and contraction in paint films leading to eventual detachment from the substrate.

---

[19]See *fig.167.*

Fluctuations in relative humidity cause even greater damage to painted decorations in organic mediums, particularly oil paints. The condition of high relative humidity can be caused by the burning of fossil fuels (such as gas and log fires) and occupation by humans. Conditions of low relative humidity are created by heating, cooling and ventilation. Draughty hallways experience pronounced cycles of change in humidity due to air movements leading to paint failure.[20]

Paint failure arising from structural failure and vibration in the underlying substrate is also common. Once a paint film has been broken in areas where it cannot bridge cracks in the substrate the paintwork will deteriorate around the break due to the loss of continuity and the resulting unequal stresses on the film. Oil medium paints tend to peel away from the break. When substrate failure is accompanied by the ingress of water, physical and chemical actions will readily combine (*fig.172*).

Paintwork in historic buildings can equally fail under the effects of gravity. Significant paint failures are observed in buildings which have a long history of regular repainting in white lead-based oil paints due to the combined mass of the paint layers.[21] Paint build-up can be so dense that the weight of the paint film overtakes the strength of adhesion of the first layer to its substrate, resulting in flaking on a grand scale.[22]

---

[20]See Case Study No.7

[21]Experience at the New South Wales Public Works department shows that many buildings constructed in the nineteenth century have interior walls with a heavy build-up of lead-based paints often applied over early distempers or wallpaper and lining paper. Failures are common in situations where the heavy paint build-up separates from the wall surface.

[22]See Case Study No.6. In the interior of Assembly Chamber the walls had a mottled appearance from the losses of large slabs of paint and paper which built up over many years before the major part of the heavy build-up of paint and paper was removed in preparation for the reconstruction of the painted decorations in 1983.

Substrate Deterioration

The condition of substrates is directly relevant to the condition of painted decorations. Unsound substrates need to be repaired without interference with or irreparable damage to the overlying painted decorations.

The majority of painted decorations survive on a plaster substrate of which the principal form of failure is detachment from the structure to which it is applied. It is rare for plaster to fail in other ways.[23]

Wall plaster detaches from masonry or timber laths when the bond between the two is broken due to differential movement, vibration or physical impact. Detachment appears as 'drumminess'.[24] The repair of drumminess is best approached from behind if it is possible to gain access to the reverse side of the plaster. However, more commonly, repairs must be made from the decorated face.

A range of specially formulated acrylic resins is available for the re-attachment of drummy plaster.[25] Various forms of acrylic resin mixes can be introduced through the face (or from the reverse side) of painted plaster to fill the voids and make a continuous bond to fill or bridge the void. Adhesive mixes are formulated for brushing, spraying or injecting according to the means of access and the task to be performed.[26]

When large voids are to be bridged adhesive mixes must be bulked out with fillers such as glass microballoons,[27] or

[23]Problems can arise with some weak plasters which are deficient in cowhair or other fibre materials when they are attacked by salts or weakened by vibration. The plaster usually stays intact but detaches from the substrate.

[24]'Drumminess' is the term commonly used to describe the presence of a void between the wall masonry and the plaster itself, which can be detected from the hollow sound when the plaster surface is tapped lightly.

[25]See, Morgan W. Phillips, 'Adhesives for the Reattachment of Loose Plaster', APT Bulletin Vol.XII No.2 1980 p.37.

[26]The various mixes described by Morgan Phillips are available in a ready mixed form from a Sydney supplier, Westlegate Pty Ltd.

thickened by chemical modification.[28] Traditional plaster mixes are unsuitable because they do not flow easily and they take some time to harden and develop strength.

Plaster commonly detaches from laths when the plaster keys break due to impact or vibration. The keys of plaster ceilings are prone to fail also under the imposed load of the plaster if the plaster becomes wet due to building failure. When moisture is present in intermittent cycles the failure is accelerated by the swelling of the timber laths and the added weight of the water. The problem can be addressed by reattaching the plaster to the keys.[29]

The most common cause of failure with timber substrates arises due to movement in the timber caused by fluctuations in temperature and humidity. In heated rooms, there can be considerable shrinkage at the beginning of winter when heating causes a major reduction in relative humidity. The resulting damage to timber panelling can be serious when shrinkage causes joinery panels to split.[30]

Loss of Adhesion

The loss of adhesion of the paint occurs when the paint pulls away from its substrate due to changes in the condition of the paint film, the substrate or differential movement between the paint and the substrate. Even sound oil painted decorations expand and contract with small changes in temperature and humidity at a different rate

[27]Microballoons are very lightweight hollow glass spheres which have the appearance of a coarse grey powder. Being spherical they impart high plasticity to the wet formulation.

[28]The adhesive can be thickened to the consistency of whipped cream by the chemical modification. Phillips describes the process of adding an alkaline ammonium salt to make the solution thixatropic.

[29]Morgan W. Phillips, 'Adhesives for the Reattachment of Loose Plaster', pp.38-41.

[30]Joinery panels are designed to accommodate movement, however the build-up of paint coatings creates a strong adhesive bond between the individual components of the joinery thus preventing them from moving freely.

from their underlying substrate. The principles of repair are the same as for substrate repairs - adhesives are introduced to re-attach the paint film to the substrate.[31]

The detachment of early paint layers due to the effect of overlayers of paint is common when the medium of early paint layers hardens and dries suffering a loss of flexibility. Then, when a new flexible coating is applied over such brittle coatings, stresses created by movement in the top layers can cause the composite of layers to tear away from the substrate. The overlayers cannot be safely removed without consolidating the base coating.

Surface Film Breakdown

Surface film breakdown usually arises only with varnishes and the cheap paints composed of unstable coal tar by-products such as bitumen due to the long drying time of the oil or bituminous medium. The cupping and flaking of embrittled oil painted decorations is more common.

Some protenaceous paint mediums break down due to the effect of oxidation, the degradation being first noticed in the form of a craquelure.[32] The painted surface develops a network of cracks due to the normal shrinkage of the medium on aging and the inability of the brittle aged film to withstand movement generated by changes in relative humidity. An exaggerated form of craquelure, known as alligatoring, which develops when the liquid medium of slow drying paints migrates away from the fine lines of cracking and creates concentrated islands of paint, can be common in composite layers. The causes of failure, however, can be quite complex.[33]

[31]The processes of re-adhesion are described in Case Studies Nos 5, 7 and 8.

[32]'Craquelure' is the term used to describe the pattern of micro-cracks which occurs as a result of the natural shrinkage of the medium on aging.

[33]Sometimes early layers of paint fail to harden and dry. They remain in a liquid state for many decades thus preventing any of the subsequent paint coatings from bonding adequately down to the substrate.

Fig. 132
Paint losses from wall decorations in the hall of Bishops Court, Clyst Honiton, Devon. The areas of loss clearly show that there is no physical bond between the paint and the plaster, except where the gold size appears to have penetrated through to the plaster.

Fig. 133
Dado decoration in the former residence of Samuel Lyons, Sydney. The paint losses occur in vertical zones along the alignment of the laps of a lining paper which had been superimposed over the decorations and itself painted. Movement in the lining paper has weakened the bond of the underlying paint causing losses in the zone of greatest movement.

Fig. 134
Damaged wallpaintings in the nave of the church at Garton-on-the-Wolds, East Yorkshire. The losses are most serious on the inside of the exterior wall and the contiguous interior cross wall due to penetration of moisture.

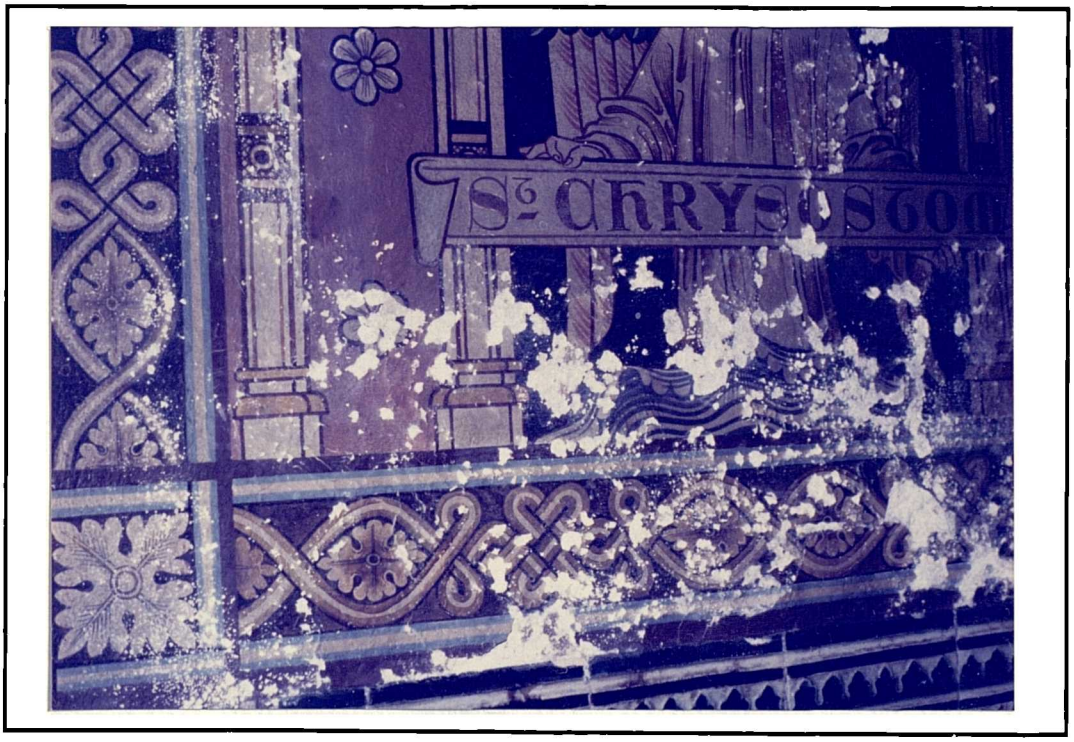


Fig. 135
Deteriorated painted decorations at Garton-on-the-Wolds. The losses relate to the effect of moisture and salt contamination in the masonry and plaster.

Fig. 136
Ceiling decorations in the Church of St Issey, Cornwall. The fungal growth is under the surface of a clear varnish which was applied over the painting.

Fig. 137
Amateur wall painting in the Commandant's residence, Port Arthur, Tasmania. The structural crack has admitted moisture accelerating deterioration of the painting.

APPENDIX C
CASE STUDIES

List of Case Studies

CASE STUDY 1

Project

ST MICHAEL'S CHURCH, Garton-on-the-Wolds, Yorks, UK
Conservation of Painted Wall Decorations

Context

The work of conserving the wall paintings at Garton-on-the-Wolds was commenced in 1986 and completed in 1991. When the wall paintings were examined by the author in 1985 they were in very poor condition, having been badly affected by damp and salts. When examined again in 1992, following treatment, they were found to be in excellent condition as a result of an outstanding program of conservation work.

Cultural Significance

The complete cycle of wall paintings at Garton-on-the-Wolds is almost unparalleled in its scope and technical excellence. The iconography of the paintings and stained glass is unique. Together they illustrate one theme, and exemplify the Victorian ideal marriage of stained glass and painted decorations.

Illustration

Project Team

Architect, Andrew Anderson; Wall Painting Conservators, Gårtner and Donald Smith, for The Pevsner Memorial Trust.

OUTLINE OF WORK

History and Background

St Michael and All Angels is a twelfth-century church which was restored and modified from 1856 by the district landowners, Sir Tatton Sykes and his son, Tatton, to designs by J.L.Pearson (1856-57) and G.E.Street (1872). The painted decorations were designed and executed poorly in the Gambier Parry spirit fresco technique by Clayton and Bell under the supervision of Street.[1]

Over the years the paintings became soiled with dust and smoke from oil lamps. Water and damp entered the wall fabric, causing major disruption of the paintwork and significant paint losses in several areas. The urgent need to conserve the wallpaintings was recognised and addressed in the recently completed program of works.

Condition

Large areas of the wall decorations were disfigured by salt efflorescences and, where the salt activity had gone unchecked, there were significant losses of paintwork. The plaster remained intact everywhere except on the south wall of the nave where an area became detached from the masonry. There was a clear relationship between the poor condition of the wallpaintings and deterioration of the fabric of the building. The plaster was detached from the wall in areas of the lower south wall. An earlier attempt to restore the paintings on the east wall of the nave resulted in areas of different tonality, requiring further treatment.

Conservation Plan

The plan to conserve the wallpaintings at Garton-on-the-Wolds was first publicly proposed by Sir Nikolaus Pevsner, the leading architectural historian, who cited the essential need for their preservation in his 'York and East Riding' volume of The Buildings of England written in 1972.

Peter Burman, then Secretary of the Council for the Care of Churches, in 1984 re-stated the urgent need for action when he proposed immediate work to secure the loose area of plaster at the lower frieze level on the south wall. The challenge was finally taken up by the Pevsner Memorial Trust which coordinated the effort of raising funds and

[1]Donald Smith revealed in an interview with the author in August 1992 that his belief is that the work was carried out in oil.

commissioning the work. The plan involved the immediate repair of the fabric of the church to arrest continuing damage to the interior by water penetration and damp. This was followed by a trial program of works on the wallpaintings in 1986 and then the actual conservation treatment, which was undertaken in five consecutive seasons of work by skilled wallpainting conservators, Donald Smith and Wolfgang Gårtner, commenced in 1987.

Conservation Treatment

Following recording and repair of the building fabric and the analysis and trial work on the wallpaintings, the conservation work proceeded in small areas in accordance with a five step procedure.

1. **Removal of salt efflorescences**
Salt efflorescences were removed from the surfaces of the painted decorations by light brushing.

2. **Consolidation of hollow plaster and flaking paint**
According to the degree of damage the plaster was re-attached using a traditional lime and washed sand plaster or by the introduction, to small voids, of lime milk made workable by the addition of casein. Areas of fresh plaster were ready to receive paint within a few days. Friable and powdery surfaces were consolidated with diluted casein applied from a hand spray.

   In that part of the lower south wall where the paintings had become detached, these were removed by the *stacco* method. The paintings were faced to keep them intact during removal and re-instatement, and cleaned. They were re-attached on a bed of fresh lime plaster as described above.

3. **Surface cleaning**
Painted wall surfaces were cleaned with nylon bristle toothbrushes and water to which stone dust was added as an abrasive in some areas. No detergents or chemical cleaning agents were used.

   The timber ceiling decorations were cleaned with soft 'scotchbrite' pads and rubber sponges of a type used in Germany on wallpapers.

4. **Repair of plaster losses**
Plaster losses were infilled with new sand/lime plaster.

5. **Reconstruction of Lost Decoration**

Losses and areas of missing decoration were infilled or reconstructed in casein emulsion paint to which a few drops of linseed oil were added. Colours were matched on site by the conservators who made up the colours from a selected range of stable pigments.

Evidence of earlier attempts to overcome the problems of damp and to restore areas of the paintings were addressed in the conservation work. Some of the decorations lay on areas of cement plasters which were considerably harder than the lime plaster. These areas were consolidated where necessary by the same method as the other areas of plaster.

Areas of the east wall of the nave containing the figures of the four doctors of the Church, which had been treated in the 1970s by re-painting, were re-treated. The modern painting was removed to reveal what remained of the authentic figures and the original painted decorations were then reintegrated by infilling.

The whole of the work was undertaken and completed under the auspices of the Pevsner Memorial Trust at a cost of more than 100,000 pounds.

A final stage of the works will be to institute a comprehensive program of monitoring of the environment of the church using thermohygrographs and squirrel data loggers, and the condition of the paintings by visual inspection or other means, to safeguard the original decorations and the conservation treatment. The monitoring is considered to be essential since the re-appearance of small areas of efflorescence indicate that the building has not yet reached a condition of stable equilibrium.

A Further Point of Significance

An additional point of significance regarding the scheme of wallpaintings and other elements of Victorian decoration at Garton is the survival and display at the church of the twelve original cartoons for the Labours of the Months. These drawings, which are displayed in their original frames, are believed to be unique. For although there are many known surviving examples of model drawings for schemes of decoration, and a fair number of cartoons for stained glass, these are the only known cartoons for painted decorations. Their existence, and their exhibition at the church, provides a new insight and a higher level of understanding of the artform.

CASE STUDY 2

Project

'FRIDAY HILL' HOUSE, Chingford, Essex, U.K.
Restoration of Wall Decorations in Former Drawing-Room

Context

The Elizabethan-style country house by Vulliamy was painted and decorated by unknown artists in the style illustrated by Arrowsmith, Ballantine and Whittock. The project undertaken in 1985 involved the removal of overlayers of paint to reveal the c.1840 scheme of decorations in the former drawing-room.

Cultural Significance

The very sophisticated painted decorations represent a rare and beautiful example of the style of decoration of the early nineteenth century as illustrated by Arrowsmith.

Illustration

Project Team

Team of up to one dozen unskilled youths employed by MSC under the direction of Andrew Thorn and Alexandra Kosinova.

OUTLINE OF WORK

History and Background

In 1839 Lewis Vulliamy extended and remodelled a building of 1608 to create the somewhat dour building in a mixed Elizabethan style. The white brick exterior is very plain. However the interior featured some fine decorative painting, possibly by the London painter Thomas Kershaw, whose surviving work in the collection of the Victoria and Albert Museum is very similar in technique to the work at Friday Hill House, which was closely modelled on decorations described and illustrated by Arrowsmith[2], Ballantine[3] and Whittock[4].

The decorations had been overpainted with a plain distemper finish about 1940 and, in following years, painted with more coats of oil and emulsion paints in plain colours.

Today 'Friday Hill' House serves as municipal offices for the London Borough of Waltham Forest.

Condition

The significant scheme of painted decorations survived in excellent condition underneath an overpainting of cream water-soluble distemper and several coats of alkyd enamel and acrylic emulsion paint finishes. The topcoats were showing signs of failure due to the poor condition of the underlying distemper. The presence of this distemper greatly facilitated the ease of separation of the overlayers from the original paintwork.

Conservation Plan

Funding was sought through an unemployment relief scheme to expose and restore the important early Victorian painted decoration. A condition of the funding grant was that the work should involve a high level of skilled labour. It was therefore decided to concentrate the conservation effort on the wall decorations only.

---

[2]H.W.and A. Arrowsmith, The House Decorator and Painter's Guide, (London: Thomas Kelly, 1840), Plates XXII and XXXIII.

[3]James Ballantine, An Essay on Ornamental Art, (London: 1847).

[4]Nathaniel Whittock, The Decorative Painter's and Glazier's Guide, (London: 1827).

The project team comprised a group of semi-skilled unemployed young artists who worked under the direction of wallpainting conservators, Andrew Thorn and Alexandra Kosinova. The project was administered by Nola Marshall of the Community Programme Agency of the Waltham Forest Council. The project was funded by the Manpower Services Commission and involved the employment of unskilled young people to remove the overpainting and restore the decorations.

Conservation Treatment

The work was undertaken from a lightweight mobile scaffolding, which was erected and dismantled regularly throughout the duration of the project to enable ongoing community use of the room. The site was kept clean and free of materials and equipment for the same reason.

The topcoats of acrylic emulsion paint were removed with spatulas after they were softened with a hot air tool.[5] The cream distemper lying over the c.1840 decorations was removed by means of water (to soften the distemper) and cotton swabs. This method enabled the removal of the overlayers without any damage to the oil medium *impasto*.

The work was undertaken in small sections. The newly exposed paintwork was protected with plain plastic sheet and the work proceeded clockwise around the room. Two or three people operated from the scaffolding at the upper levels while others worked adjacent or on the lower level.

The sound condition of the decorations, and their resistance to the effects of water, made it possible for the unskilled assistants to use the cotton swabs to remove the distemper without damage to the oil painted surfaces below. It is a striking feature of the restored decorations that they show no signs at all of having been overpainted. The *impasto* has retained a truly beautiful texture.

The work of exposing the entire scheme of wall decorations continued over a period of about six months.[6]

---

[5]Gentle heat was supplied from a tool called the Leister 'Labor'. This softened and separated the emulsion film from the underlying distemper.

[6]The actual time spent on the work was considerably less than six months, however the need to make the room available for council activities significantly prolonged the process.

CASE STUDY 3

Project

GOVERNMENT HOUSE, Sydney
Cleaning and Consolidation of the Painted Ceilings of the Drawing-Rooms.

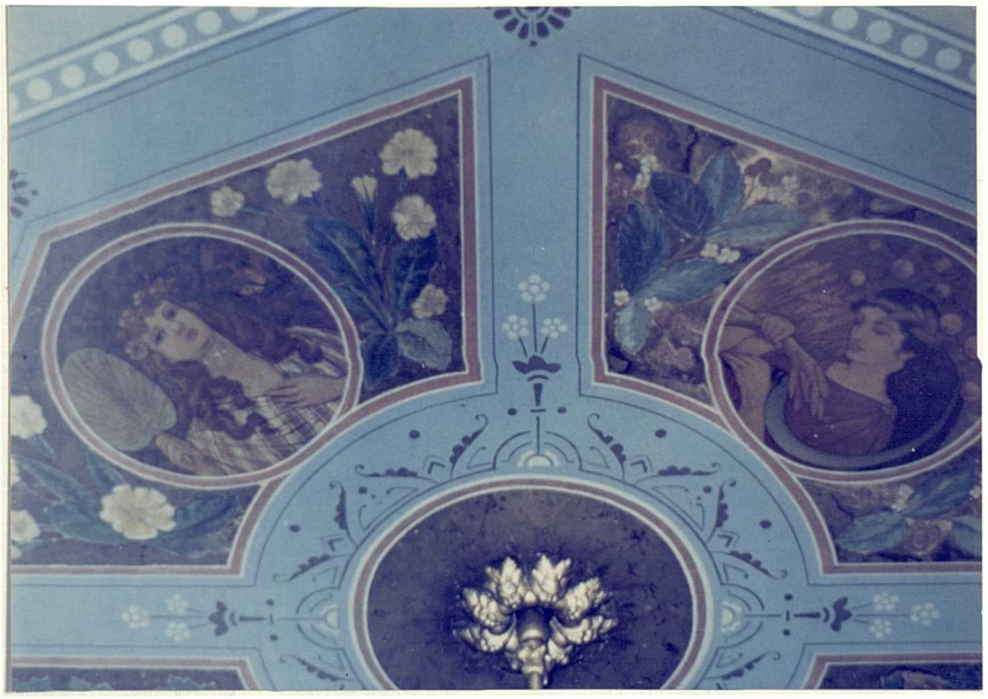
Context

The ceiling decorations survive from a comprehensive Aesthetic scheme which conformed to the model developed in Britain by the Art decorators. They had become soiled and slightly damaged, requiring consolidation and cleaning.

Cultural Significance

The ceiling decorations were painted by the most important firm of decorators working in Australia at the time. This example of Lyon and Cottier's work is from the period of their greatest influence and it survives in rooms which are largely furnished with their original furniture.

Illustration



Project Team

Work undertaken by A.Kosinova and A.Thorn for the NSW Public Works Department. D.Ellsmore, Architect.

OUTLINE OF WORK

History and Background

Government House was built to the design of Edward Blore during the years 1837-43. It was initially furnished and decorated very modestly with furniture from an earlier building and some additional materials supplied by Trollopes of London. The vice-Regal residence was substantially re-modelled and re-decorated in the 1870s.

In 1878 the drawing-rooms, together with the other state rooms, were re-decorated by Lyon, Cottier and Co. The ceilings in each room were hand-painted and stencilled in an eclectic style. The drawing-rooms acquired a strong Aesthetic character which derived from the combination of the painted decorations with Moresque draperies and brilliant upholstery fabrics and carpets supplied from Sydney's David Jones Emporium.

Maintenance of the building was well documented in keeping with its role as the principal place of Sydney social activity. Work on the building was carried out by the Colonial and Government Architects. Work was well recorded, although interior decorations were never recorded as thoroughly as other building works. An important source of information are the figures of expenditure in the annual reports.[7] These reveal the amounts spent annually on furnishing and renovations.

Condition

Although Government House was a very well maintained building, the interior decorations were not conserved to the same high standard as the building fabric. Only the painted ceiling decorations of the original aesthetic scheme remained intact following many overpaintings of all of the wall and joinery decorations, commencing from the 1930s. The paintwork on the ceilings had become soiled during more than one hundred years of exposure. There were minor paint losses due to flaking in some areas and discoloration in other areas where earlier repair work had been carried out in unstable materials. It was proposed therefore to clean the ceilings and to undertake essential consolidation and repairs in 1986.

---

[7]New South Wales Government, Annual reports of the Colonial and Government Architects, including the Government Gazettes.

Conservation Plan

The conservation plan evolved over a period of several years. It commenced with a change in direction from regular maintenance to genuine conservation of the authentic decoration, including lighting and furnishings. With the agreement of the NSW Government the State Rooms are to be restored over a period of years and their authentic decorations preserved. Lesser rooms are to be adapted sympathetically for continuing traditional use.

The great significance of the decoration undertaken in 1878 is acknowledged and this will be conserved.

Treatment of Ceiling Decorations

The treatment proposal by Kosinova-Thorn was prepared during a brief examination of the ceiling from mobile scaffolding in June 1986. The pigments and medium were analysed and emergency consolidation treatment work was carried out. Cleaning tests were undertaken to assess the full extent of the required remaining work.

The full programme of cleaning and consolidation work was carried out over a three week period in December 1986.

The painted decorations had been executed in flatted oil paint enlivened with oil gilding. The central feature of the main drawing-room is a panel of four paintings, the 'four seasons', painted onto a ground of oil gilding on textured paper. This, together with the two roundels depicting 'night' and 'day', executed in artists oils on canvas by a different hand, had been painted in the studio and pasted to the ceiling.

Although the overall effect of the decorations is one of blue/green tones, the palette of pigments was limited. Only white (white lead), yellow (yellow ochre and chrome yellow), red (vermilion, red lead, iron oxide and red lake), blue (Prussian blue, French ultramarine and indigo) and black (carbon black) were revealed by pigment analyses. A small quantity of brown earth had been used in the feature paintings of the seasons.

The conservation treatment was undertaken to address three problems, namely, the surface deposits of dirt and grime, the two areas of losses and retouching (which were directly below the first floor bathroom plumbing), and

staining of the main border of gilding which is believed to relate to salt efflorescences which arise from condensation on the gold facilitating the movement of salts from the plaster.

The rooms occupy an area which is sensitive to the presence in the atmosphere of large quantities of aerosols from the nearby harbour and the Botanic Gardens.

It was observed that the ceilings had been cleaned some time before, leaving some areas undercleaned and others overcleaned, causing an uneven appearance. Thus it was agreed to aim for uniformity rather than total cleaning. Special care was taken with the high and pointed impasto of the stencil work to avoid removal of the raised stippling. On the coated oil gilding the cleaning aimed to remove the salt efflorescences and the crumbling varnish in the areas of the efflorescences. The cleaning was undertaken with a solution of 50% acetone and 50% de-ionised water applied with a cotton swab which was used also to pick up the softened dirt and degraded material. Plain de-ionised water only was used on the Four Seasons.

As areas of flaking paint were encountered these were consolidated with BEVA 371, a modern colourless heat-activated adhesive with excellent properties. The adhesive was applied to the areas of flaking. The paint and adhesive was laid down with a heated spatula. BEVA 371 was selected also as the medium for the areas requiring minor retouching. The role of the BEVA in these situations was to fill the areas of loss and to consolidate the borders of those losses. Where new pigmented fillers were required to tone in the losses, solid artists acrylic was used.

Following cleaning of the areas of gilding, which involved the removal of degraded varnish, a new varnish was required to seal the gold leaf and to offset further condensation and salt efflorescence. For this a mixture of Ketone N resin (a low molecular weight polymer) and microcrystalline wax was selected. It was used as an easily reversible trial varnish protection against the recurrence of further salt efflorescence. It has had the added bonus of unifying the appearance of the gilding.

The deep plaster cornices were cleaned in conjunction with the ceiling decorations. It was confirmed during this procedure that the original treatment of the coved section of the cornice comprised vertical striping of gold leaf applied over a sanded ground.

CASE STUDY 4

Project

GOVERNMENT HOUSE, Sydney
Reconstruction of Ballroom Decorations

Context

The ballroom was re-decorated by Lyon, Cottier and Co. in 1878 together with the other State rooms. During the past sixty years the decorations have been concealed by overpainting in plain light colours. The ceiling of the ballroom was further covered with a superimposed 'Gyprock' sheet plaster ceiling on timber battens in the 1950s when rock blasting on the adjacent Sydney Opera House site caused some cracking of the decorated plaster ceiling.

Cultural Significance

The original decorations were an integral element of the highly significant scheme painted by Lyon and Cottier.

Illustration:

Project Team

The work was undertaken by painters from the NSW Public Works Department with assistance from Lynley Stirling, acting as consultant. Architect, D.Ellsmore.

OUTLINE OF WORK

Condition

The original decorations were determined to be sound beneath the overlayers of paint and plaster but that it would not be feasible to uncover and conserve them.

Conservation Plan

The poor presentation of this highly significant nineteenth-century house became of concern around 1980. A decision was taken to redirect all future maintenance work towards conservation in an ongoing programme to restore the external fabric, the interiors and the grounds to an appropriate state. Conservation work on the interiors commenced in the main hall in 1982 while research into the nature of finishes in the ballroom was concluded. It was concluded that the ballroom decorations should be reconstructed as part of the conservation of the 1878 decorations in the suite of state rooms.

Conservation Treatment

It was known from documentary and photographic records that the ballroom had been painted with elaborate stencil decorations by Lyon, Cottier and Co. With a little additional research it was confirmed that the walls had been painted in shades of gold and white in harmony with the yellow satin upholstery.[8] A model of these decorations was prepared from the documentary sources. Black and white photos of the 1880s provided detail of the structure of the decorative scheme and further details were gleaned from the portfolio of Lyon and Cottier design papers now held in the Mitchell Library in Sydney.

While undertaking this off-site work the author arranged to study a small number of John Lyon's reference books which had been purchased some years earlier from the John Lyon estate by a private collector. By an extraordinary coincidence the design by John Lyon for the ballroom ceiling (*fig.113*) was discovered, interleaved, in one of the books. This provided essential information for the completion of the conservation plan.

---

[8]The ballroom upholstery fabric, described as gold coloured in the 1880s, showed in photographs as a dark shiny fabric. This was revealed to be a deep yellow satin when samples were recovered from the couches.

Following the preparation of designs and estimates a pilot project was undertaken to reconstruct the decorations to the upper level of the orchestra gallery, an 1899 addition to the south end of the ballroom. According to imprecise detail in photographs this had been decorated in a similar scheme to the ballroom, and overpainted in the 1930s. This work was undertaken, without the need for scaffolding or any disruption to official functions in 1982.

The painted decorations on one half of the small trapezoidal shaped flat plaster ceiling of the gallery were exposed using methylene chloride paint stripper and blade scrapers to remove the thin overlayers. The condition of the underlying paintwork was found to be poor, partly due to the process of stripping, and unsuitable for permanent exposure. While these decorations were accessible the other half of the ceiling was painted to match the original scheme. Then the first half was re-painted also.

The stone walls of the gallery had been first painted in 1899 in a simple scheme of stone colours with contrasting trim, highlighted with a powdering of gold stencils. Just sufficient of this was exposed by means of selective paint stripping to enable reproduction of the full scheme.

The reconstruction work was carried out in alkyd enamel house-paints in semi gloss finish. Most of the colours were matched to British Standards by the contract painter who undertook the work. A small number of the colours were mixed on site to exactly match the original.

The work in the ballroom proper commenced 1984. The room was fully scaffolded and the superimposed plasterboard ceiling was removed to enable research of the colours and patterns of the original decorations. Since there was by then a clear understanding of the nature and extent of the underlying decorations it was necessary to uncover only small areas to enable the decorations to be traced and the colours to be matched to the now obsolete 'Allphase Colour Concept Paint System'. When this work was concluded a new plasterboard ceiling was fixed to the existing battens without causing further damage to the original lath and plaster ceiling.

The work of reconstructing the ceiling decorations, commenced in April 1984, followed closely the methods described in contemporary reference works. The trueness of the ceiling was checked and the central point determined by striking diagonal string lines from the corners. The broad

pattern was then laid out, making adjustments in the plain areas, before the foundation colours were painted in. For this project low-sheen acrylic latex paints were chosen and all but the smallest amounts of tinted colours were pre-mixed off-site by the Pascol Paint Company.

The stencils were cut from cartridge paper coated with shellac and the colour was applied by means of small plastic sponge rollers which produced the slightly stippled effect of the traditional stencil brush with the added advantage that, on the overhead work, the rollers held the cut edges of the stencils to the ceiling surface during the application of the paint thus overcoming the problem of ragged or smudged edges. The process of reconstructing the stencil decorations and associated handpainting took the team of six painters eight weeks.

Some uncertainty surrounded the six applied panels of musical symbols which showed only vaguely in the photographs and did not survive under the overpaintings. There was, however, evidence of an adhesive mastic in the positions of the panels which suggested that the musical trophies had been painted onto linen or a similar fabric and pasted to the ceiling. The same process was adopted for the reconstruction. Conjectural designs were worked up from contemporary illustrations of musical trophies and these were painted onto primed Belgian artists linen.

The wall decorations posed a dilemma which was finally settled by the intervention of H.E. the Governor. The frieze and dado decorations were reconstructed. However the stencilled wall filling which is now known to have been an example of David Hay's patented imitation fabric finish, could not be clearly determined by the process of selective paint removal. The paint stripper attacked the soft wax-like ground of the finish preventing satisfactory removal of the overlayers to reveal a clear impression of the finish. When proposed samples were rejected by the Governor it was agreed to paint the wall filling in a plain colour. The reconstruction of the David Hay imitation gold damask will be considered again at some time in the future.

In all other respects the decorations, including the furniture and drapes (of gold satin), the curtain cornices, glass chandelier and wall mirrors were reinstated in accordance with the detail of contemporary illustrations in a highly satisfactory manner.

CASE STUDY 5

Project

PARLIAMENT HOUSE, Sydney
Conservation of Painted Decorations in Lobby

Context

The lobby was due to be restored as part of the overall conservation works programme undertaken between 1980 and 1985. Research revealed the important scheme of decorations which were partially uncovered, recorded and reconstructed in conjunction with the other works.

Cultural Significance

The construction and decoration of the lobby was a very significant aspect of the development of the Parliament House complex. The decorations are the earliest of their type in Australia and they add very great significance to the lobby and the complex of historic buildings.

Illustration

Project Team

Work undertaken by the NSW PWD with assistance from Stirling-Stevens and the Institute for the Conservation of Cultural Material, NSW Branch.

OUTLINE OF WORK

History and Background

During the 1860 winter recess of Parliament the Houses were improved by interior renovations and the construction of a refreshment room and an arcaded lobby. The new lobby, constructed to link the existing wings and new refreshment room, was painted and decorated by Mr Rennie[9]

Prior to the initial research it was not known that the lobby had been decorated although it was anticipated that such a space would have been decorated with painted decorations of some sort. The newspaper report confirming that work had been undertaken was produced by the Parliamentary Librarian in 1981 while general renovation work was in progress. A subsequent search of pictorial material produced a sketch with a hint of the decorations.

Conservation Plan

The development of the conservation plan was an evolutionary process involving the detailed analysis of the decorations prior to consideration by the parliamentary building committee of the conservation options. The Committee called for the preparation of painted sample boards prior to accepting a proposal to preserve small sections of uncovered decoration in conjunction with a full reconstruction of the 1860 scheme of decorations.

Schemes of the same date were reconstructed in the adjoining spaces even though the construction of some of these spaces dated from an earlier period.

Conservation Treatment

The initial sampling and microscopical analysis of samples revealed stencilling and gilding indicating a comprehensive scheme of decorations. Approval was given by the Committee for a series of test panels to be uncovered. This work, undertaken in 1981, revealed decorations over the entrance to the Legislative Assembly and the Pompeiian style scheme of painted decorations in the arcaded lobby consistent with the contemporary illustrations.

---

[9] The Sydney Morning Herald, 25 September 1860. Mr Rennie is believed to be Walter Renny, who is listed in the Sands Directory as, Painter and Paper Hanger to the Government, Royal Blue House, 170 Pitt Street, Sydney.

In the hope that it might be possible to uncover and preserve the full scheme of decorations AICCM (the Australian Institute for the Conservation of Cultural Material) the professional association of materials conservators, undertook to carry out preliminary work as a volunteer project towards this aim. They concluded that the plaster substrate onto which the decorations were painted was in poor condition due to structural movement and continuing moisture ingress. A fair amount of remedial building work was needed to conserve the finishes. They also determined that the panel of decorations over the entrance to the Legislative Assembly had become unstable following exposure and that it would require a fair amount of consolidation to prevent paint losses.[10] This became the primary object of their work.

The exposed painted decorations were consolidated using the consolidant BEVA 37, an adhesive formulated for the treatment of oil paintings. BEVA is known to be stable in colour when exposed to light and it is unaffected by moisture. The BEVA was introduced behind the flaking paint which was then laid down with a heated spatula.

The second object of the work was to uncover a pristine example of the painted decorations which could be matched in the reconstruction of the full scheme of decorations. The process commenced with the testing of various solvents and it was concluded that an ammonia solution was the safest to be used.

The panel of decorations was exposed by removing the topmost overlayers with methylene chloride which was kept moist with Japanese tissue. The softened layers were then mechanically scraped away. The middle layers were dry scraped with scalpels before undertaking the final removals with the ammonia solvent. Once uncovered, losses from the panel were repaired by means of pigmented plaster to infill the losses. The whole panel was then protected with a coating varnish of Acryloid B72 acrylic resin.

The final step in the work was the reconstruction of the 1860 scheme of decorations. The painting and stencilling was carried out in interior acrylic emulsion house-paints mixed to the required colours by the Pascol Paint Company.

[10]When paint surfaces are exposed by means of chemical stripping of the overlayers following a long period of overpainting it is found that the paint film is prone to cup and flake because the oil paint medium has become brittle and the paint film is weakened by the process of stripping off the overlayers of paint.

The panel of painted decorations over the entrance to the Legislative Assembly was protected by an overlayer of conventional lining paper prior to the reconstruction of the same scheme of painted decorations in modern acrylic paint over these original decorations.

During the period of site research, roundels of a tacky mastic-like finish were uncovered on the coved soffit of the roof lantern. The soft material was imprinted with the pattern of a woven fabric presumed to be canvas or linen. It is believed that the roundels locate the positions of paintings, possibly portraits of former premiers or prominent parliamentary figures painted on canvas and fixed in position by means of the mastic adhesive. They probably date from around 1880, when the chambers were redecorated.

It is believed that they might have been removed when the lobby was redecorated in recent years. But despite a careful search for information about these paintings none have been located.

CASE STUDY 6

Project

PARLIAMENT HOUSE, Sydney
Reconstruction of Decorations in the Assembly Chamber

Context

Following the decision by the Parliamentary Building Committee to conserve the Assembly Chamber with historical accuracy it remained to decide, from the several schemes of decoration, which would be most suitable for re-instatement. The predominantly green scheme of 1906 was considered to be the most appropriate.

Cultural Significance

The high degree of significance of the scheme of decorations derives from the historical importance of the chamber and the choice of leading decorators; Lyon, Cottier and Co. to paint a green scheme acknowledging the Westminster convention.

Illustration

Project Team

Work by the NSW PWD with assistance from Stirling-Stevens.

OUTLINE OF WORK

History and Background

The Assembly Chamber was erected in 1843 by Colonial Architect, Mortimer Lewis. The earliest of several identified schemes of wall and ceiling decorations took the form of plain paintwork and wallpapers.

The Chamber was elaborately decorated by Lyon, Cottier and Co. in 1880. The decorations included a painted sky with elaborate border to the ceiling and walls and a wall filling of all-over stencils in earth colours on a straw coloured background. This scheme was replaced in 1906 when the chamber was modified by the addition of a new gallery and a coffered decorative metal ceiling with eight roof lantern lights. A new scheme of decorations in the symbolic green colours of the lower house at Westminster was painted also by Lyon, Cottier and Co. The scheme survived for half a century until the decorations were painted over in the 1950s.

Condition

Excellent surviving evidence of the 1906 scheme of decorations was available in 1982 when it was decided to reinstate the scheme. It was considered to be the most appropriate decoration for the surviving form of the architecture. The ceiling was in very sound condition but the wall surfaces were poor due to failure of both the plaster and the heavy build-up of paint and wallpaper from at least six different schemes of decoration.

Conservation Treatment

The work was undertaken during the winter parliamentary recess of 1983 using the same methods and the same team as was employed in the reconstruction of the lobby decorations the previous year. Work began with the erection of scaffolding and a full working platform for the treatment of the ceiling and upper wall frieze.

The pressed metal ceiling was painted in accordance with the original detailing of a uniform cream coloured treatment highlighted with gilding to the raised portions of the decorative metal. The gilding was carried out in Dutch metal sealed with shellac to prevent tarnishing of the artificial leaf.

The walls required a considerable degree of consolidation and repair prior to repainting. Large slabs of the composite build-up of paint and paper were removed where the coating was no longer soundly bonded to the substrate.

In some areas the heavy coat of loam wall plaster was drummy and required to be re-adhered to the masonry. The plaster consolidation work was undertaken with acrylic resin consolidants which were injected into the cavities between the plaster and masonry to re-bond the two. The adhesive mix was thickened or filled as necessary according to the size of cavities to be bridged.

The painted decorations were reconstructed in acrylic latex paints by the same methods followed in the foregoing case studies. All of the colours were specially mixed by the Pascol Paint Company to samples matched to Munsell references. The application of the stencil decorations was carried out by the small team of young painters who had been trained on the job the previous year on the work in the adjacent lobby. The team traced the original patterns, prepared the stencil paper, cut the stencils, laid out the work and carried out the stencilling under the direction of Lynley Stirling.

Some minor departures from the original scheme of decorations were made necessary by minor modifications to the architectural detail. These were able to be resolved within the framework of the decorations. One such modification was the application of a superimposed acoustic board lining to the lower walls of the Chamber to accommodate a new sound recording system. The lining board was painted and stencilled in the same manner as the plaster walls, without any visual distraction from the overall effect or the fine detail.

Heavy velvet drapes were introduced also to assist with the modification of the acoustics. These were made up in the style of the historical revivals of the early twentieth century.

The carpets for the Chamber were woven on traditional Wilton looms to patterns developed from the photographic evidence of the original carpets used with the 1906 decorations. As no sample of the originals has survived, the colours were selected with reference to a wide range of contemporary examples which were appropriate to the colouring of the Chamber.

CASE STUDY 7

Project

ROUSE HILL HOUSE, North-West Sydney
Consolidation of Marbling in the Entrance Hallway

Context

The house has been occupied continuously by the Rouse/Terry family since the time of its construction. Its contents comprise an accumulation of great historical significance which is to be preserved. The work of consolidating the mid nineteenth-century marbling to the hallway walls was undertaken in November 1986.

Cultural Significance

Rouse Hill House is an important house museum which demonstrates through authentic fabric, furnishings and family effects the history of an important pioneering family and colonial culture in New South Wales.

Illustration

Project Team

Work by Kosinova-Thorn for the NSW Historic Houses Trust, with supervision by D.Ellsmore, NSW PWD.

OUTLINE OF WORK

History and Background

Rouse Hill House, built by Richard Rouse, the NSW Government overseer, was commenced in 1810. In the 1860s the house was extensively renovated and redecorated in accordance with prevailing Victorian taste. Wallpapers and furnishing fabrics were imported directly from England for the purpose.

The decoration and accumulated furnishings and contents have remained virtually unaltered during the continuous occupation by the family over more than a century. The house is thus an unparalleled 'time capsule' of historical, architectural and social information.

The entrance hallway, a small space with stone flagged floor and plain plastered walls and ceiling, was repainted at the time of the 1860s redecorations and furnished with hunting trophies and framed engravings. The walls were marbled and lined out in imitation of ashlar stonework.

Condition

The paint (of the marbling) was extremely brittle, requiring immediate consolidation. Significant losses in the lower two metres of the wall surface were attributed to the combined effects of air currents through the hallway together with physical abrasion from the movement of furniture and household cleaning activities.

Conservation Plan

The conservation plan for Rouse Hill House requires that the house and its contents are to be stabilised and conserved without alteration. Although the house has sustained considerable damage and some structural failure all conservation works are planned to avoid damage to any of the finishes.

The policy of the Historic Houses Trust for the hallway is to maintain the surfaces in the present condition and to arrest any further deterioration or paint losses. Since there is very little adhesion between the paint layer and the plaster it was proposed in mid-1986 to stabilise the entire marbled wall surfaces by the introduction of a consolidant to bond flaking or vulnerable areas of paint.

Conservation Treatment

The consolidant chosen for the work was a mixture of microcrystalline wax and Ketone N. It was applied to the surface in a thick paste which was then 'ironed' through the paint with a heated spatula. Following curing of the consolidant the surface residues were removed with solvent on cotton buds.

In the friable areas the consolidant was applied in a thin paste. In some areas the very friable paint needed to be protected with a facing of silicon parchment through which the consolidant was applied and 'ironed'.

The paint film was vulnerable to both heat and abrasion. It had cupped in a way that made it also very vulnerable to loss through physical abrasion. The dessicated paint film had lifted in many areas and generally overall it could not be laid perfectly flat. Therefore the cupping in many areas remained even after consolidation but this did not seriously reduce the adhesion of the consolidant.[11]

The work of consolidating the paintwork over an area of approximately 80 square metres was completed in three weeks by the two conservators working without the aid of scaffolding or other special equipment.

---

[11]Kosinova-Thorn, 'Rouse Hill House, A Brief Report on the Wallpapers and Painted Surfaces in Selected Rooms', prepared for the New South Wales Government Architect, January 1987.

CASE STUDY 8

Project

ST BARTHOLOMEW'S CHURCH, Sutton Waldron, Dorset, UK
Restoration of Painted Decorations

Context

The Council for the Care of Churches took a direct interest in the painted decorations in 1978. In 1980 the Council organised a seminar which was attended by leaders in the field of conservation of nineteenth-century painted decorations. In 1981 the Council made funds available for conservation work to be undertaken by a team from the City and Guilds of London Art School Conservation Department.

Cultural Significance

The Church is a Puginian model church described by Pevsner as one of the best and most lovely examples of Victorian architecture. The interior contains possibly the most important scheme of painted decorations by Owen Jones.

Illustration

Project Team

City and Guilds of London Art School Conservation Department under the direction of Margaret Ballardy. Work carried on by Andrew Thorn and Alexandra Kosinova.

OUTLINE OF WORK

History and Background

The Church was designed by architect George Alexander and decorated soon after its construction in 1847 with painted decorations by Owen Jones and tiles by Pugin. Jones apparently never succeeded in reproducing classical polychromy completely restored as he believed it should have been. At Sutton Waldrom the primary reds and blues are contrasted with the warm cream stonework onto which they are painted directly. As with some of the other grounds, Jones would have preferred to use gold or yellow.

The timber boarded ceiling and plastered walls were painted originally in conventional white lead oil paint. The decorative motifs and lettering varies subtly in different areas suggesting the work may have been carried out in more than one campaign. The decorations to the underside of the curved brackets of the hammer beam roof trusses were painted onto zinc sheet (probably off site) and fixed with tacks.

Condition

Much of the original decoration in distemper was painted over with plain paint finishes, the latest application being made in 1952 when the pale blue emulsion paint was applied to the walls of the nave and chancel. The exposed decorations had deteriorated to the point whereby consolidation was considered necessary.

Conservation Plan

The work commenced without a clear plan. For, although the importance of the Jones decorations was understood and their conservation viewed as most urgent, a great deal of time and effort was spent uncovering large expanses of the early paint finishes. Clearly the plain surfaces did not have the same degree of significance as the stencils and decorative text. Therefore it is felt that the absence of a clear plan led to unnecessary outlay on work of limited value. The plain surfaces could have been re-painted to the original finishes without diminishing the value of the cverall conservation treatment.[12]

---

[12]Later stages of the work were handled differently but they are not reported here since they were completed following the original submission of this thesis.

Conservation Treatment

The removal of the overpainting was achievable by the application of acetone which caused the blue paint layer to bubble and crack instantly. The acetone was daubed on with cotton swabs which were used also to pick up the separated layers of paint. Acetone, being a highly volatile solvent, posed little damage to the underlying layers of the painted decorations due to the very fast drying time of the solvent.

In the lower walls a serious problem of damp caused the adhesion of the primary paint layer to be very weak. Thus the removal of the overlayers was risky. The problem was overcome by consolidating the paint layers by re-bonding them back to the substrate prior to removing the overlayers. For this task the unusual choice of microcrystalline wax was made. The wax was softened and pushed into the crazed surface of the paint with a heated spatula, allowing the heat-thinned wax to run into the void behind the paint film and then set solid upon cooling. The heated spatula served also to press flat the cupped and crazed paintwork.

Following consolidation of the composite paint build-up it was possible to remove the top layers with acetone. This had no effect on the wax consolidant.

In 1985, following several summer campaigns in the church, the work was well advanced. Nearly all of the work in the high wall areas of the chancel had been completed.

The use of wax as a consolidant on this project is considered to be less than ideal. For although the conservators argued strongly for their method it is felt by many that the choice of consolidant was ill-informed. The presence of moisture in the masonry could contribute to a loss of adhesion of the wax-consolidated paint.

CASE STUDY 9

Project

ST GEORGE'S HALL, Newtown, New South Wales
Investigation of a Grand Scheme of Painted Decorations

Context

It was known from the surviving physical evidence that the hall had been highly decorated although there were no early photographs or drawings of the intact interiors. An investigation was undertaken to obtain a record of the decorations prior to building conversion work.

Cultural Significance

The decorations, painted by J.Ross Anderson in 1903, are the only known surviving example of his work in Sydney. Their exceptional scale and complexity, although typical of Anderson's style, make them unique amongst surviving works of the period.

Illustration

Consultant

Work undertaken by Stirling-Stevens in 1981 for the NSW Public Works Department.

OUTLINE OF WORK

History and Background

The building, second in size only to the Sydney Town Hall, was built in 1888 by a company floated for the purpose. However this company passed into the hands of receivers and remained undecorated for thirteen years. The hall was lavishly and artistically decorated in 1903 by Anderson in a style described as late French renaissance.[13]

Although built on a very grand scale for use as a centre for community entertainment, it served for most of its life only as a warehouse. Its role as a major venue for public gatherings petered out in the 1930s.

The building was purchased in the late 1970s by the New South Wales Department of Education for conversion to a performance venue in conjunction with the development of the performing arts high school on the adjacent site.

Condition

The painted wall decorations were in very poor condition due to building alterations, overpainting and neglect over a long period. The ceiling decorations, which had been painted onto lining paper then glued to hessian and tacked to the boarded ceiling, were almost totally destroyed.

Conservation Plan

The work was undertaken as a prelude to the preparation of a conservation plan. The work of recording the decorations was undertaken as a precaution against their total loss or destruction during the future building works or continuing delays in proceeding with building works.

It was clear that the re-instatement of the decorations was unlikely given the inadequate budget for conversion of the hall to its proposed new use. Nevertheless it was hoped that this option could be preserved for the future and funds were obtained for the program of recording the essential details of the important Anderson scheme of painted decorations.

---

[13] Sydney Morning Herald, 28 July 1903. The decoration was described as being painted in relief and this was confirmed to be the *grisaille* method.

Method of Recording

The recording of the decorations was undertaken in 1981 by conventional means. The outline of the painted decorations were traced and the original colours were matched to Munsell colour references. The information was transferred to heavy cartridge paper and the main features of the decorations later reproduced in scale model form (of the entire ceiling scheme) and full scale details of the principal decorative motifs. The work was undertaken from mobile scaffolding but, due to time and cost constraints, only the key elements of the decoration were recorded.

The ceiling decorations, which were attached to the hessian ground, had fallen away from the boarded ceiling leaving only a patchwork of pieces from which to recover the details. Enough of the decorations survived to verify that the simple scheme in cream, blue and gold had been constructed around the three elliptical light/ventilation domes.

The outer ceiling border of free flowing Romanesque detail was handpainted. It varied in width also, suggesting that it was adjusted to accommodate irregularities in the building plan. The bands of Greek key and other classical motifs were stencilled.

At the top of the wall there was a deep frieze of partly handpainted swags and *cornu copia* combined with circular medallions in rich reds, blues and gold. Corner features including lyres and sprigs of foliage enhanced the overall scheme of decorations.

The wall fillings were plain. The lower walls, which had been decorated with musical symbols arranged around gilded mirrors, had been re-plastered in recent years with the result that all detail of the lower wall decorations was missing.

The decorations on the former proscenium, which featured painted busts of the muses, comedy and tragedy, were too badly damaged to record.

Following the recording of the decorations all work on the interiors of St George's Hall ceased. At the time of revision of this thesis no current proposal to reconstruct the painted decorations had been formulated and no other substantial work on the hall had been undertaken.

CASE STUDY 10

Project

ST ISSEY PARISH CHURCH, Cornwall
Conservation of Chancel Decorations

Context

In 1985 a contract was issued by the Parish Council to local wallpaintings conservators for the restoration of the decorations which had become damaged and soiled. The decorations were then considered to be worthy of restoration.

Cultural Significance

The scheme of decorations is a very fine and rare example of standard late nineteenth-century church decorations as recommended by the Audsleys and the publication, The Journal of Decorative Art.

Illustration

Project Team

Work by Richard Stokoe and Anthony Fanshaw of Herbert Read of Exeter for the Parish of St Issey.

OUTLINE OF WORK

History and Background

The church was built during the fourteenth and fifteenth centuries. The chancel is Cornish fifteenth-century standard. The nave and west end tower were substantially rebuilt in 1870 following the collapse of the tower. In 1882 the chancel was decorated in the style recommended by Audsley[14] as illustrated in the Journal of Decorative Art.[15] The work was undertaken by west country decorators.[16]

Condition

The painted decorations were in mostly sound condition although there were areas where structural cracking had occurred and in places some very rough and unsightly repairs had been undertaken by parishioners. The aim of the restoration work was to undertake repairs to cracking and to restore the painted decorations.

The decorations were damaged in several places due to failure of the building fabric as a result of foundation settlement. Excessive moisture was entering the fabric and accumulating within. There was evidence of fungal growth under the painted decorations on the roof plaster.

Conservation Plan

The plan was to conserve the church with its painted decorations and to reconstruct the small area of decoration which had been damaged and repaired clumsily in the past. It was considered acceptable to reconstruct missing decorations in new materials in order to complete the full scheme and to re-integrate small areas of lost or badly damaged decoration.

It is clear that the Parish instigated the work with the aim of brightening and enhancing the decoration.

---

[14]The decoration conforms in all respects of colour, pattern and construction to the descriptions and illustrations of W.& G. Audsley, Polychromatic Decoration in the Medieval Styles, 1882.

[15]The Journal of Decorative Art ran a series of articles on church decoration between 1884 and 1889 in which was illustrated a scheme which might be the same as at St Issey (see *fig.89*).

[16]Pencil graffiti on the roof trusses includes the following; 'W.Whatley Frome Somerset Decorators 1882' and 'Fred James Frome Som't Oct 1882'.

Conservation Treatment

The work progressed from the roof downwards. During the first three to four weeks conservators worked from scaffolding to clean the roof using clean water only. The varnish layer over the plaster of the roof between the roof trusses was found to be harbouring a fungus due to the high moisture content in the plaster (relating to condensation). The conservators believed that this problem could be arrested by the application of a sound varnish coating of 'Ketone N'. It was not considered to be practical to attempt to remove the discoloration from the fungal growth.

The walls, which were painted with traditional lead-based oil paint, and the pipes of the organ, were cleaned with a fine solution of 'Autosolve', an ammonia and china clay abrasive paste normally used to clean chrome plated metal parts of motor vehicles. After the removal of surface deposits with the 'Autosolve' the residue was removed with white spirit. Cracks in the wall plaster were filled with a commercially available filler called 'Fine Surface Polyfiller' prior to the in-painting of the paint losses.

The in-painting of losses was considered to be important to integrate the repairs. It was carried out in modern artists' acrylic[17] and executed in a manner which matched the existing patinated paint finishes.

It is anticipated that the new work will remain stable while the original aged finishes continue to slowly deteriorate and change in subtle ways. However, should any dramatic change occur due to instability it will be possible to reverse the in-painting and repairs without damage to the original finishes. The selected processes were considered for their future reversibility.

[17]Rowney's 'Cryla' acrylic medium.

CASE STUDY 11

Project

ST PETER'S CHURCH, Vauxhall, London
Conservation Treatment of Three Wallpaintings

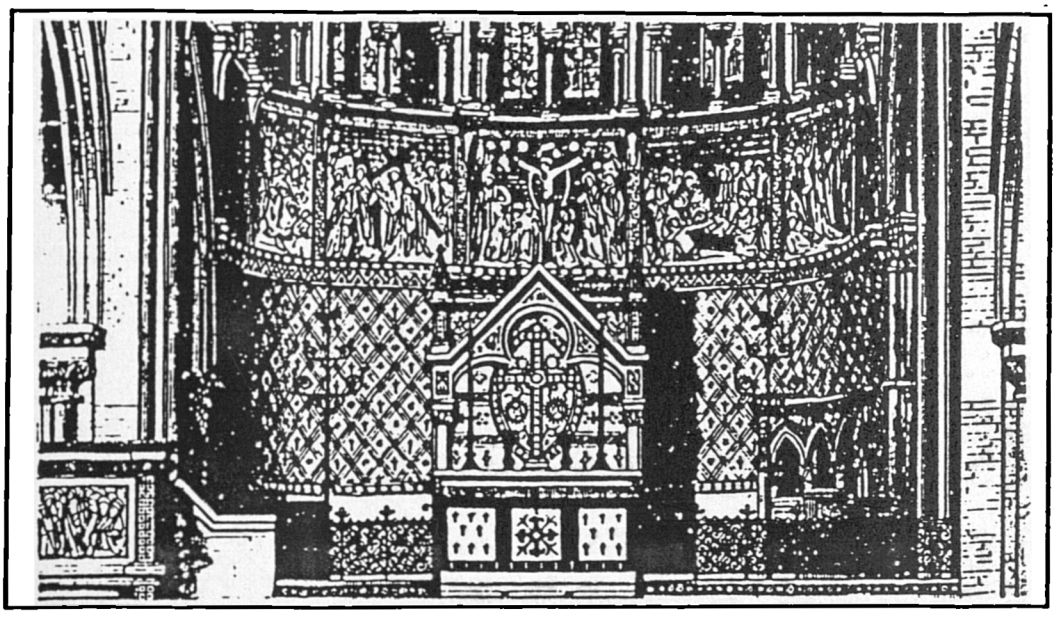
Context

This was J.L.Pearson's first major town church. The apsidal east end was decorated by Clayton and Bell with seven large paintings of the Passion Cycle. These paintings were in need of conservation treatment which was undertaken by students from the City and Guilds of London Art School Conservation Department with assistance from students from the Friday Hill conservation project.

Cultural Significance

The wallpaintings and glass were essential to Pearson's concept of a correct example of ecclesiological design. Both the architect and the decorators were leaders in Victorian church design and decoration.

Illustration



Project Team

Work by students of the City and Guilds of London Art School Conservation Department under the supervision of Margaret Ballardy.

OUTLINE OF WORK

History and Background

The church is a rather plain red brick building in the Gothic style planned in 1860 and erected 1863-4. It was the first modern church in Britain to employ masonry ribs filled with brick. It was planned and designed by J.L.Pearson to address the east end and altar. Although it was intended to have a detached campanile, this was not built because funds ran out prior to completion.

The style is austere, being a well proportioned mixture of twelfth and thirteenth-century Gothic combining English, French and Italian influences. Attention is concentrated in east end where the Clayton and Bell stained glass and wallpaintings draw the worshiper's attention.

Condition

The face brick interior walls, onto which the figures were painted, had been prepared with plaster. This foundation was very poor, being powdery, and the paint was flaking. The primary coat of blue had discoloured to a brown due to chemical change in the Prussian blue pigment. The haloes in the central panel had been reduced to a thin crumbly layer by aggressive cleaning some time in the past.

The paintings had also become very sombre due to the accumulation of surface deposits of dust and grime. The paintwork had degraded badly.

The conservation treatment of three of the figures[18] was undertaken in the summer of 1985

Conservation Plan

The conservation plan involved the progressive treatment of the interior decorations in stages to suit the limited budget. The wallpaintings were considered to be worthy of detailed conservation treatment in recognition of their artistic and liturgical significance.

The choice of conservators is not recorded but it is assumed that the Guild school offered to undertake the work on behalf of the Parish.

---

[18]The three panels depicted Christ carrying the cross, the Crucifixion, and the Descent from the Cross.

Conservation Treatment

The project was run as a training exercise and all procedures were carefully recorded. Scaffolding was erected to a suitable working height and the walls below were protected with plastic sheet. The area above was carefully vacuumed to prevent dust from descending onto the treatment area. Colour balanced work lamps were installed on the scaffolding to illuminate the work area.

The initial examination of the paintings and cross-sectional analysis of samples revealed three paint layers - the primary coat of white lead and Prussian blue, the background with diapering in red ochre on Prussian blue, and the painted figures. The background of diapering had been flatted.

The figures were painted onto a ground of white lead in oil. The blue background (the primary coat) exhibited a brownish tinge due to a chemical change in the surface pigmentation. This could not be altered or removed to reveal the true nature of the blue.

Some areas of flaking paintwork were re-adhered with a 5% solution of 'Paraloid B72' in toluene. Three thin applications by soft brush were made to effect the desired consolidation. The surfaces were then able to be cleaned using one of three different methods.

The surface deposits on the figures (from candle burning) were removed with a solvent solution of 5% 'Vulpex' and 1% ammonia in de-ionised water. A paste of the same was made with pumice powder to 'roll away' the most stubborn build-up. The alkalinity of the solution made it unsuitable for the blue background which was cleaned with a solution of 40% acetone and 60% white spirit.

The lettering was cleaned with a solution of 90% white spirit and 10% 'Vulpex'.

In small areas of disfiguring as a result of losses a varnish of 'Ketone N' was applied prior to the inpainting of the losses with colours mixed from pigment and 'Liquitex' (acrylic) medium. The inpainting was then stippled to impart a surface texture like the original. Finally a protective varnish of 'Ketone N' and microcrystalline wax was applied over the three wallpaintings.

CASE STUDY 12

Project

ST VINCENT'S HOSPITAL CHAPEL, Sydney
Recording of Painted Decorations

Context

When it was proposed to demolish a portion of the St Vincent's Hospital complex to make way for a new development it was believed that two nineteenth-century chapels, which were to be demolished, contained painted decorations worthy of recording. In 1986 the nurses quarters containing the smallest of the two chapels and the adjacent freestanding chapel were demolished.

Prior to demolition the painted decorations in both of the former chapels were researched and the details recorded.

Although it was known from the Lyon, Cottier and Co. papers that the firm had been involved in decorating the chapels it was not then known if their scheme had been executed, however the history of the decorations was soon revealed when the site research was commenced.

Cultural Significance

The St Vincent's Hospital Chapel and nurses home had been designed by William Wardell and decorated in part by Lyon, Cottier and Co. As recorded works of the leading firm of decorators operating in Sydney in the nineteenth century the decorative scheme was significant and although the heritage protection agencies could not be persuaded that the buildings and their decorations should be preserved intact, funds were granted for the recording of the painted decorations prior to demolition.

The decorations add considerably to knowledge of decorating techniques of the period and of the work of Lyon, Wells, Cottier and Co.

Project Team

Research undertaken by the NSW Public Works Department with assistance from Stirling-Stevens.

History and Background

In 1887 Lyon, Cottier and Co. painted and decorated the small chapel in the nurses quarters of St Vincent's Hospital. Ten years later the small chapel was abandoned in favour of a new chapel erected adjacent to the nurses quarters. This was also decorated by Lyon, Cottier and Co. in a simple scheme concentrating attention on the chancel. The designer of the first scheme of decorations is believed to have been Andrew Wells. The details of the stencilling on the varnished roof timbers strongly indicates Wells's involvement.

During the life of the chapel it was redecorated several more times. One scheme of predominantly pale blue colours featured a fantastic array of cherubs, angels and other fanciful decorations probably completed in the 1930s. But like the other schemes of painted decorations these were painted over in the 1950s with a plain monochrome scheme. This was a very fine example of the firm's work.

Scheme 1

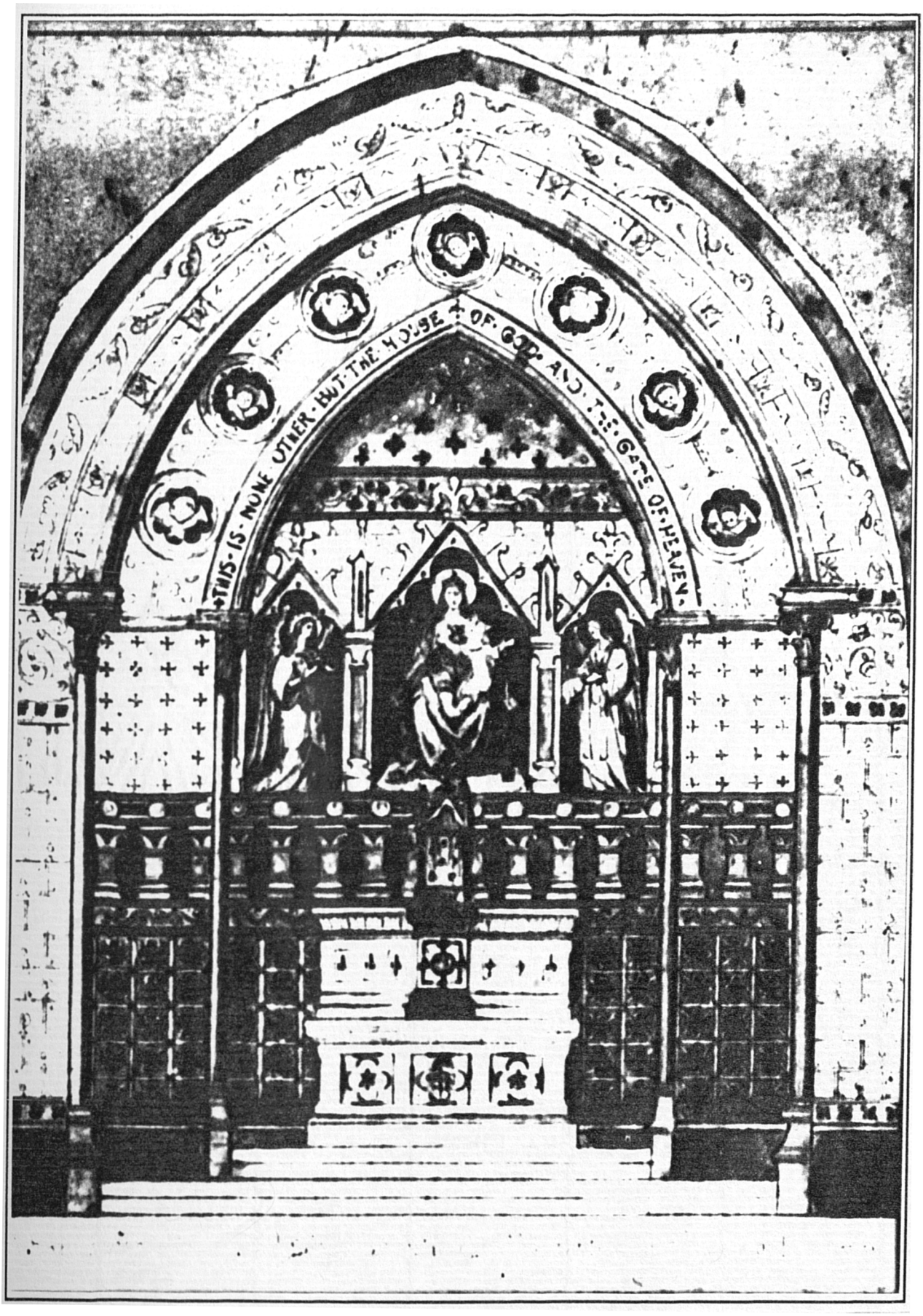
The first chapel had been painted with an all-over stencil pattern, without a dado. The ceiling of varnished boarding on exposed rafters was highlighted by simple black and gold stencils.

Scheme 2

The second chapel was decorated with a relatively simple scheme of painted decorations which concentrated attention on the chancel and on the chancel arch. The panelled ceiling was decorated with gilded lines and corner ornaments to the panels. The walls were decorated with stencil bands defining the horizontal wall divisions and the windows and the chancel arch. These decorations were painted over with a very different scheme some time around 1930. The most recent paintwork is plain.

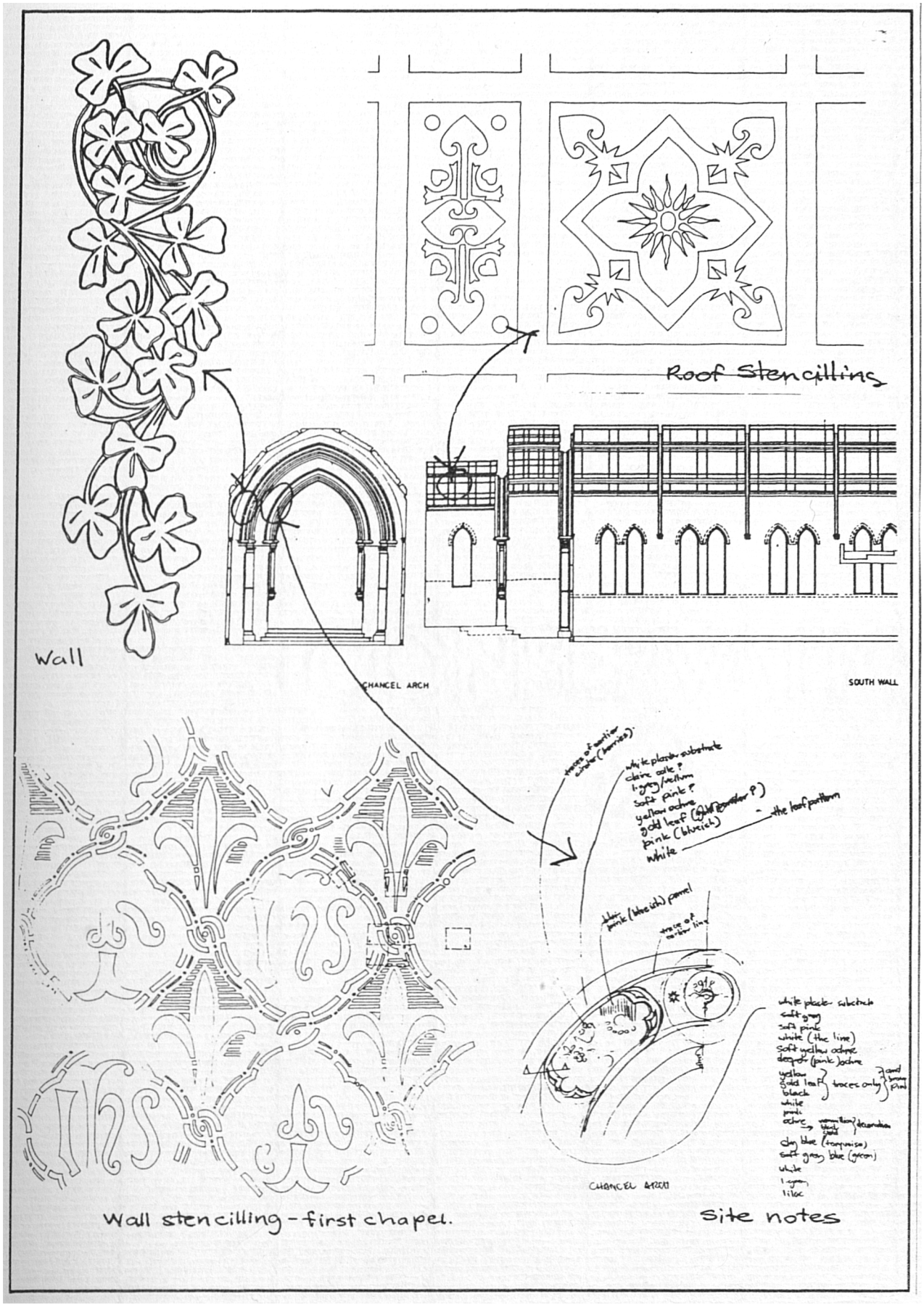
Condition

The condition of the painted decorations was not known at the commencement of the research. However it was assumed that the decorations survived intact under the superimposed layers of paint.



Design by Lyon, Cottier and Co. for the painting of the East End of the Second Chapel (1897). Source: Mitchell Library, Sydney.

View of the East End of the Second Chapel (c.1930) showing the second scheme of painted decorations. Source: St Vincent's Hospital Archives, Sydney.



Examples of the reduced scale drawings of the painted decorations exposed during research on the Chapel at St Vincent's Hospital in 1986. Source: NSW Public Works Department.

OUTLINE OF WORK

Method

The first site work involved sampling and cross-sectioning of a full range of samples to determine the nature and extent of the paint layering. The samples confirmed the presence of the all-over wall stencilling in the early chapel. The cross-sections also revealed the relationship between the different schemes in the second chapel and the relative location of the scheme in the c.1930 photograph.

The decorations were exposed for recording by the proven fast method of selective stripping using chemical paint stripper and a 'Gem' blade scraper. The exposed decorations were photographed and the patterns traced. The paint colours were matched to Munsell references.

The wall treatment in the first chapel was very difficult to expose due to the poor condition of both the coating and the substrate. The finish might have been applied in either oil bound distemper or another equally unstable medium. There was insufficient time on site to confirm this and there has not been any subsequent analysis of the cross-sectioned samples. On site it was found to be more convenient to record the outline of the pattern of stencilling while the overlayers were still intact. Once the chemical stripper and scraper were used to remove the overlayers this process cut through the composite build-up revealing only a confusing blend of the stencil and background colours.

Just sufficient of the wall stencilling was revealed to record a lace-like effect of deep red stencils on an emerald coloured background. This is a rare example of the finish which was first introduced by David Hay and possibly used commonly by Lyon, Cottier and Co.

During demolition a small *quatrefoil* window to the north wall of the early chapel was discovered. It was glazed with a simple pattern of brilliant, predominantly ruby and amber coloured glass. The glass was concealed by four elaborately painted timber panels. The colours of these panels conformed to the palette recommended by the Audsleys. There is no adequate explanation for the fact that the very beautiful glass had been covered with wooden panels and later completely bricked over. It is possible that the stained glass admitted too much sunlight.

CASE STUDY 13

Project

New South Wales House-Paints
Study of the Currency and Traditional Use of House-Paints

Context

A detailed study of New South Wales house-paints was undertaken by the New South Wales Public Works Department (PWD) in conjunction with the New South Wales Institute of Technology (NSWIT) beginning in 1984 and concluding in 1987. The purpose of the study was to establish, from surviving samples and documentary evidence, a body of information on the nature and currency of use of house-paints in New South Wales.

The majority of the samples had been collected over a five year period from NSW PWD and Sydney Cove Redevelopment Authority (SCRA) projects. Much of the documentary research had been undertaken also prior to commencement of the study. Scientific analysis of samples was undertaken progressively at the NSWIT.

Aim of Study

The aim of the research was fourfold, being:

- to develop a computerised data base from documentary sources.

- to physically test and examine paint samples using visual miscroscopy to identify colours and classify them using Munsell references and simple descriptions of characteristics; by using X-ray diffraction on documented individual paint samples to determine the presence of crystalline compounds, and scanning electron microscopy on documented multi-layer cross sections to identify elements, and thence pigments.

- to analyse the data gathered, identifying patterns and currency of use. To also identify paint recipes which represent commonly-used nineteenth-century house-paints.

- To recreate paints from the recipes and test these under conditions of exposure to accurately determine the visual characteristics of nineteenth-century house-paints.

Project Team

Research by Donald Ellsmore (NSW PWD), Dr George Gibbons (NSW Institute of Technology), Katherine Blackmore (Research Assistant) and Clare Watson (assistant).

Procedure

At the commencement of the study it was believed that there was a considerable amount of inaccurate information about the nature of nineteenth-century house-paints. Paint finishes on many projects were reconstructed in modern materials and publicly proclaimed as authentic, even though the characteristics of the pigments, vehicles and methods of application could not allow for a reasonable recreation of the appearance of the original finish.

It was felt that a data bank of accurate information could be prepared for the benefit of architects and others involved in the conservation of nineteenth-century structures. The data bank, to be permanently located at the NSW Heritage Council, would be capable of expansion and reinterpretation by researches in the future.[19]

At the time of writing detailed conclusions are still to be drawn from the analytical research and the reproduction paints are yet to be made up for interpretation and analysis in accordance with the aims of the second phase of the study. Notwithstanding this, it is possible to draw preliminary conclusions from the work.

In the main, the results confirmed that house-painting practices in New South Wales conformed to practices in Britain. The short delays in obtaining materials, including new pigments from Europe, caused only a small lag in practical and stylistic developments in Australia.

The pattern of use of white base pigments was clearly charted from the SEM analyses. The samples showed that white lead was used as the base of external oil paints until around 1920 when recognition of its toxicity led to the compulsory introduction of substitutes such as Zinc White and titanium dioxide.

Zinc White came into use around 1880 and its use increased until it was superseded by titanium dioxide in the 1920s.

[19] A simple relation data base and data-element dictionary was used to build up the data file. It was developed with the capacity to retrieve information by colour, date (of use), pigment, medium and other keywords.

Further research will determine if the zinc in many of the samples indicates the use of Zinc White or Lithopone (ZnS + BaSO4). Barium is indicated in samples of mainly exterior paints from 1850 through to 1920. The barium in most samples suggests the use of barytes, as an extender, but some might be Lithopone.

In the first decades of settlement in New South Wales lime and whiting were the common base pigments for interior and exterior washes, even on sophisticated buildings. Oil paints (based on white lead and linseed oil) superseded water-based exterior washes from 1850 onwards. Interior plastered walls were distempered with whiting and size from the first decade of the nineteenth century.

The range of available pigments was initially very limited, but the choice improved over the decades. However the range of colours did not approach comparable European choice until after 1850.

A wider choice of pigments coincided with the introduction of flatted oil finishes in the better classes of building. By the 1880s the choice of both colours and finishes was comparable with European standards. The introduction of 'Duresco',[20] which became a very convenient and economical form of interior flat wall and ceiling paint finish from the 1870s, is indicated by the increase in recording of zinc, barium and sulphur in the samples.

British house-painting practices were followed in New South Wales from the moment the materials were available there. References to colour were the same and, although the range of pigments was not as extensive as in Britain and Europe, wherever it was possible to obtain them, the same pigments were either produced locally or imported.

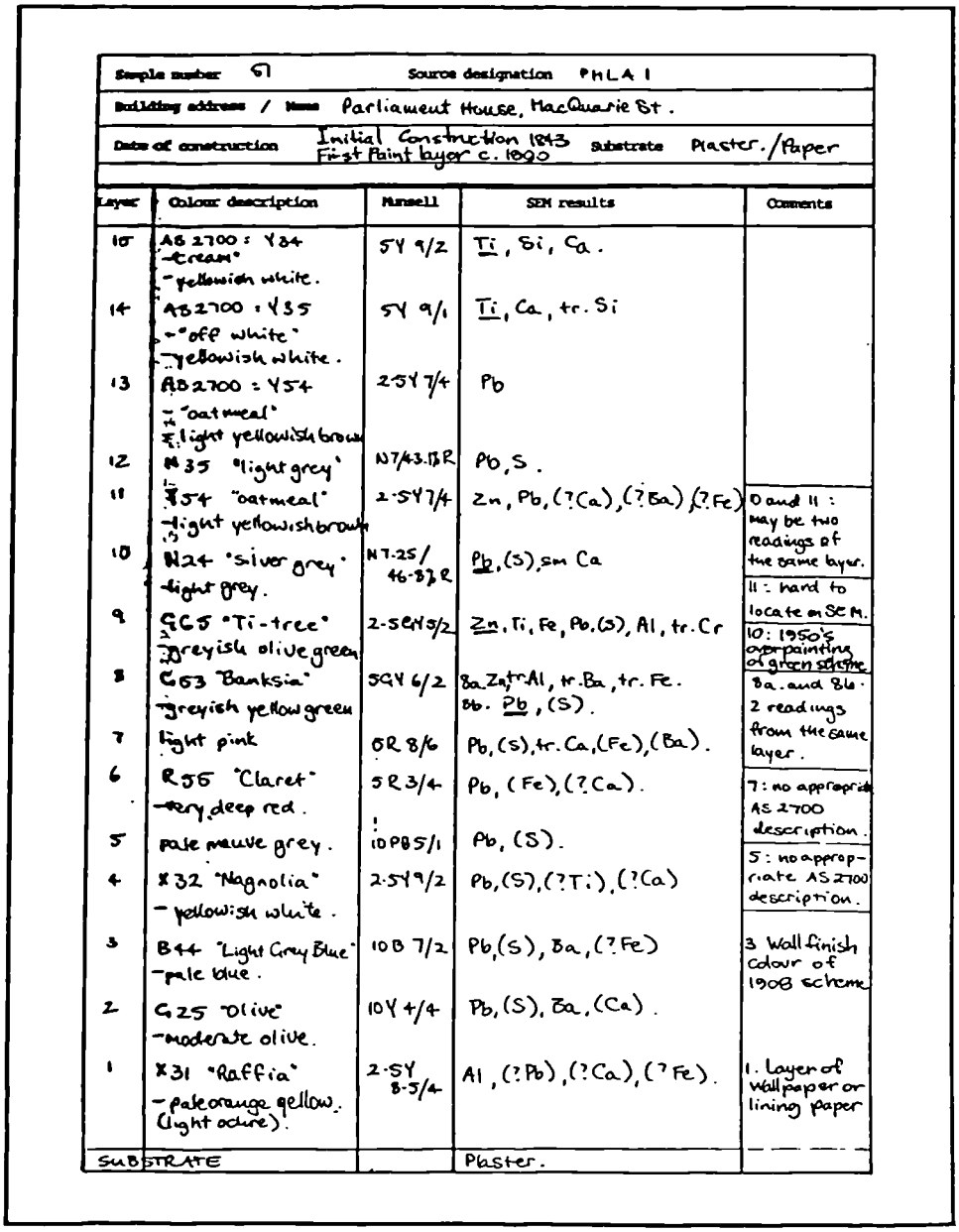
Pigments like Oxford Ochre and Frankfort Green, which derived their names from their principal source, are believed to have been imported, although they might have been locally produced from pigments which were very similar to the pigments from which they derived their name.

Colour names like celestial blue and monastral blue appeared briefly in early New South Wales references.

---

[20] 'Duresco' was a new style of paint made up on a base of Zinc White produced by the mutual decomposition of barium sulphide and zinc sulphate.

Most pigments could be identified by their common names. Colours could be described by their widely used names. Even distinctive colours like salmon and terra cotta (which were used widely on stuccoed Italianate-style buildings in an obvious attempt to reproduce the colours of Sydney's indigenous sandstone) was not given the name of 'stone'. These colours retained the names of their common associations. The terms, 'stone', 'light stone', 'mid stone' and 'dark stone' were used to describe the common colours normally adopted for the painting of surfaces which might normally have been constructed in the genuine materials.



Sample number 51 Source designation PHLA 1

Building address / Name Parliament House, MacQuarie St.

Date of construction Initial Construction 1843 Substrate Plaster./Paper
First Paint layer c. 1890

Layer	Colour description	Munsell	SEM results	Comments
15	AS 2700 : Y34 "cream" - yellowish white.	5Y 9/2	Ti, Si, Ca.	
14	AS 2700 : Y35 - "off white" - yellowish white.	5Y 9/1	Ti, Ca, tr. Si	
13	AS 2700 : Y54 - "oatmeal" - light yellowish brown	2.5Y 7/4	Pb	
12	N35 "light grey"	N7/43.1BR	Pb, S.	
11	Y54 "oatmeal" - light yellowish brown	2.5Y 7/4	Zn, Pb, (?Ca), (?Ba) (?Fe)	10 and 11 : may be two readings of the same layer.
10	N24 "silver grey" - light grey.	N 7.25/ 46-B7R	Pb, (S), sm Ca	11 : hard to locate on SEM.
9	GC5 "Ti-tree" - greyish olive green	2.5GY 5/2	Zn, Ti, Fe, Pb, (S), Al, tr. Cr	10: 1950's over painting of green stone
8	G63 "Banksia" - greyish yellow green	5GY 6/2	8a. Zn, tr. Al, tr. Ba, tr. Fe. 8b. Pb, (S).	8a. and 8b. 2 readings from the same layer.
7	light pink	5R 8/6	Pb, (S), tr. Ca, (Fe), (Ba).	
6	R55 "Claret" - very deep red.	5R 3/4	Pb, (Fe), (?Ca).	7: no appropriate AS 2700 description.
5	pale mauve grey.	10PB 5/1	Pb, (S).	
4	X32 "Magnolia" - yellowish white.	2.5Y 9/2	Pb, (S), (?Ti), (?Ca)	5: no appropriate AS 2700 description.
3	B44 "Light Grey Blue" - pale blue.	10B 7/2	Pb, (S), Ba, (?Fe)	3 Wall finish colour of 1908 scheme
2	G25 "Olive" - moderate olive.	10Y 4/4	Pb, (S), Ba, (Ca).	
1	X31 "Raffia" - pale orange yellow. (Light ochre).	2.5Y 8.5/4	Al, (?Pb), (?Ca), (?Fe).	1. Layer of wallpaper or lining paper
SUBSTRATE			Plaster.	

Example of a data sheet from the Study. Source: NSW Public Works Department.

APPENDIX D
BIOGRAPHICAL NOTES

Adam, Robert (1728-1792): Architect and Designer.
The most celebrated of the four sons of Scottish Architect, William Adam. During his long career in partnership with his brothers James and William he designed interior decorations including painted decorations. He gave his name to the decorative style which is characterised by low relief plaster decorations (for walls and ceilings) finished in striking pastel tints. Important works include Harewood House, Yorkshire (1771) and Mellerstain, Berwickshire (1765).

Anderson, J.Ross (1862-1929): Artist and Decorator.
Was apprenticed to his decorator father in Aberdeen and London. He arrived in Sydney in 1885 where he gained employment first with J.Clay Beeler and then with Lyon, Cottier and Co. In 1887 he worked as Andrew Wells's assistant, then with the Paterson Brothers in Melbourne before opening his own business in 1890. His drawings demonstrate a consummate talent. Important works include, Old Prahran Town Hall, Victoria (1890); Gaiety Theatre, Melbourne (1893); Wesley Church, Perth, Western Australia (1896); Tivoli Theatres, Adelaide and Sydney (1900); Melbourne Exhibition Building (1901); St George's Hall, Newtown, NSW (1903); Town Hall, Richmond, Victoria (1906); E.S.and A. Bank, Collins Street, Melbourne (1925).

Audsley, George Ashdown (1838 - 1925): Architect and Author.
Born in Scotland. In 1856 he moved to Liverpool where he set up an architectural partnership with his brother William. Together they published a number of chromolithograph books beginning in 1861. Noted works include Outlines of Ornament in the Leading Styles (1882); Polychromatic Decoration in the Mediaeval Styles (1882), and The Practical Decorator and Ornamentist (1892), published jointly with Maurice Ashdown Audsley.

Ballantine & Allan: Artists and Decorators.
James Ballantine (1808-1877) worked as a slab boy to David Roberts in Edinburgh before setting up a house-painting business. He established a business with Allan, a stained glass artist, in 1837. In 1843 the firm won the competition to design and produce the stained glass in the New Houses of Parliament, Westminster. Their works include Ballantine's, Treatise on Painted Glass (1845).

Barnet, James (1827-1892): Architect.
Born in Scotland. He arrived in Sydney in 1854 to work as a stonemason and clerk of works on the new Sydney University buildings before entering the Colonial Architect's office. In 1863 he was appointed Colonial Architect and remained in office until 1890. He presided over the period of greatest development in NSW public building. He was one of the first to recognise the talents of John Lyon whom he employed on almost every major building during his term of office. Their most notable collaborations include the Sydney GPO (commenced 1866); Government House, Sydney, colonnade and State rooms (1878) and the Garden Palace, Sydney (1879).

Beeler, J.Clay (c.1840-c.1920): Decorator.
An American-trained painter who studied art in Chicago as a pupil of G.G.Garibaldi. Was recognised as one of the finest decorative artists in the United States. He arrived in Sydney in the mid-1880s and established a business which specialised in photographic backgrounds and theatrical work. Works include the Criterion Theatre, Sydney (1885); Centennial International Exhibition, Melbourne (1888); King's Theatre, Melbourne (1908)

Blacket, Edmund (1817-1883): Architect.
English-born, he emigrated to Australia in 1842 where he established an important practice which concentrated on Gothic, mainly ecclesiastical, building. Although he was not a great user of painted decorations, he was trained as a stained glass artist and his influence as the pioneer of ecclesiological design in New South Wales had a significant bearing over the broader field of decorative arts. Major works include Sydney University (1858).

Bodley, George F.(1827-1907): Architect.
Designed buildings in a decorated style of extreme elegance and refinement. He was sent as a pupil in 1845 to work under G.G.Scott. In the 1860s his style moved to forms with much interior enrichment. He worked with the PRB during the 1860s. His major early works include St Michael's and All Angels, Brighton (1859) and St Martin-on-the-Hill, Scarborough, Yorkshire (1861). He entered a partnership with Thomas Garner in 1869.

Bonnar, Thomas (1810-1873): Decorator.
One of the most important decorators in Scotland. From an Edinburgh family of decorators with whom he trained he moved to Glasgow to work on steamships. Returned to Edinburgh and took up a position as head decorator with

D.R.Hay in 1839. Left Hay and formed a partnership with Carfrae (later joined by Purdie). Their work was some of the best undertaken in the late nineteenth century.

Bowie, Campbell Tait (c.1810-c.1895): Decorator.
Trained in glass staining with Ballantine and Allan in Edinburgh before moving to Glasgow where his business became one of the largest, employing 200-300 men during the busy seasons in the 1880s. Major works include the Glasgow Town Hall (1884) and Ayr Station Hotel (1886).

Brown, Ford Madox (1821-1893): Artist.
One of the great British historical painters. Having trained in Europe he moved to London to participate in works in the Houses of Parliament. Was sought out by Rossetti and became involved with the PRB. His greatest achievement in decorative art was the twelve frescoes in the Manchester Town Hall (1880-92).

Brydon, John McKean (1840-1910): Architect.
Born in Scotland. Studied in Liverpool, Italy and Edinburgh before joining Campbell Douglas and J.J.Stevenson in Glasgow in 1863. Moved to the London office of Nesfield and Shaw around 1867. In 1869 joined Daniel Cottier in the business 'Wallace and Cottier, furniture designers and decorators'.

Burges, William (1827-1881): Architect.
Trained with Blore and Digby Wyatt. Travelled extensively in Europe from 1849 to study art and architecture. He also studied vicariously the arts of Japan, India, Scandinavia and North Africa. He designed only a small number of buildings. His richly decorated and fantastic buildings made a highly significant impact on the High Victorian movement. Most important works are Cardiff Castle, Castell Coch (1865-75) and St Fin Barre's Cathedral, Cork (1876).

Burne-Jones, Sir Edward Coley (1833-1898): Artist and Decorator.
Introduced to decorative art by Rossetti through whom he met William Morris and became involved in the PRB and the Firm. He possessed a natural sense of decoration and had the rare capacity to design for large areas. Best known for his paintings of the period 1864 to 1878 he also designed much of the stained glass produced by Morris in the early years.

Butterfield, William (1814-1900): Architect.
One of the leading architects of the Gothic Revival. His

work was hard, angular and multi-coloured. His major works include All Saints Margaret Street, London (1850) and Keble College, Oxford (1870).

Campbell Smith and Co.: Painters and Decorators.
Charles Campbell (1843-1896) trained as a church decorator before forming a partnership with Frederick George Smith in 1873. Henry Alexander Campbell joined the firm in 1881. Charles was introduced to artistic decoration by William Burges who taught him to draw and to use colour. The firm decorated all of Burges' buildings and later did many town halls, clubs, theatres, halls, churches and residences. The long-running business has recently redecorated many important Victorian buildings. Important projects include their work in collaboration with William Burges (1873-84).

Clayton and Bell: Artists and Decorators.
John Richard Clayton (1827 -1913) and Alfred Bell (1832-1895) became partners in 1855 and their studio (for stained glass) and decorating business became one of the largest in the Victorian period. Clayton was a competent artist and decorator before working in glass. Bell worked as a designer in leading architectural offices before giving up architecture to concentrate on stained glass about 1854. They were introduced to painted decorations by G.F.Bodley and G.E.Street. Their circle of influential friends with whom they collaborated on decorative commissions included Stacey Marks, Rossetti and Thomas Gambier Parry. Their important works include, All Souls', Haley Hill, (1859); St Augustine's, Kilburn, London (1871); St Leonard's, Newland, Worcestershire and Garton on the Wolds, East Yorkshire (1865).

Colling, James Kellaway (1816-1905): Architect and Author.
Less well known for his buildings than his books which were widely used as pattern-books by Gothic Revival architects. Gothic Ornaments (1848-50) was followed by Details of Gothic Architecture (1852-56), Art Foliage (1865) and Examples of English Mediaeval Foliage (1874).

Cottier, Daniel (1838-1891): Artist and Decorator.
Trained as a stained glass artist in Glasgow and London before establishing a career in stained glass and painted decorations first in Edinburgh, then Glasgow and London. He then joined with talented Scottish designers in a number of decorating businesses which embraced glass design, painted decorations and Art furnishing in London, Glasgow, New York and Sydney. His greatest contribution was made through the work of his colleagues who developed

and carried on his ideas into a wonderfully rich artform. He was undoubtedly one of the great figures of the decorative arts revival. His best works include Dowanhill church, Glasgow (1867), Queens Park UP church, Glasgow (1867 demolished) and 'Cairndhu', Helensburgh (1870).

Crace, John Diblee (1838-1919): Decorator.
A member of the important decorating family firm which was commenced by Edward Crace (1725-1799) and carried on by John (1754-1819), Frederick (1779-1859), John Gregory (1809-1889) and his son F.Gregory. The list of decorating commissions of the family includes many of the most important of the eighteenth and nineteenth centuries. John Gregory collaborated on important works such as the Houses of Parliament, Westminster; the Crystal Palace and Leeds Town Hall which John Diblee Crace redecorated in 1894. He also wrote an important treatise on decoration called The Art of Colour Decoration (1912).

Crane, Walter (1845-1915): Designer, Painter and Illustrator.
Trained as a wood-engraver he was influenced by pre-Raphaelite and Japanese art. The popularity of his illustrations led to commissions to design wallpapers, textiles, carpets, stained glass, mosaics, plasterwork, and mural decorations. He was a follower of William Morris and a propagandist of the Arts and Crafts movement.

Cutler, Thomas William (c.1842-1909): Architect.
Designed some important buildings but made his greatest contribution with his beautifully illustrated Grammar of Japanese Ornament and Design (1880).

Daly, César (1811-1894): Architectural Journalist and Editor.
France's leading Architectural journalist and editor. He was raised in poverty in England and educated in France. State-appointed architect to the Cathedral of Albi from 1844 to 1877. He was editor of the *Révue Generale* from 1840 to 1890. His *L'Architecture Privée* (1864) was a very influential book in Britain and Australia.

Day, Lewis Foreman (1845-1910): Designer.
Worked initially as a stained glass designer before moving into other areas of decorative art. He was a founding member of The Art Workers' Guild (1884). His inexpensive pattern books have been useful to generations of designers.

Denny, John Bun (c.1800-1892): Architect.
Estate builder to the Earl of Shrewsbury. He worked with

Thomas Willement, Pugin and William Wardell. He followed Wardell to Melbourne in the 1850s to superintend the construction of Wardell's private commissions. Later joined him in practice.

Dobie, George (1824-c.1890): Painter.
Developed a prosperous painting and decorating business in Edinburgh. Took his sons William Fraser Dobie and John into the business in 1878 and 1886. The firm was responsible for the decoration of many churches, theatres and public halls, including the Westminster Town Hall.

Dresser, Christopher (1834-1904): Designer, Writer and Lecturer.
Born in Glasgow. He enjoyed a long and prosperous career as a designer. His contribution to the development of decorative design was outstanding. He contributed several books on botany, decorative design and ornamental art before becoming involved with Japanese design and Aestheticism in the 1880s. His work as a designer of wallpaper and other decorative materials was prodigious.

Dyce, William (1806-64): Painter and Educationist.
Born in Scotland. Studied historical and religious painting in Rome. Painted frescoes in the Houses of Parliament, Westminster (1848-64), Osborne House (1848) and All Saints Margaret Street (1850).

Eastlake, Charles Lock (1836-1906): Architect and Writer.
An exponent of the revived 'Early English' or 'Modern Gothic' style. His influential book, Hints on Household Taste (1868) was widely followed in America where the Aesthetic style took on the term 'Eastlake' style.

Edis, Col. Sir Robert William (1839-1927): Architect and Author.
A minor master of the Queen Anne school of English architecture. His best-known legacy is the publication of a series of Cantor lectures he delivered in 1880, Decoration and Furniture of Town Houses (1881).

Goatcher, Phil (c.1860-1931): Designer.
English-born artist, worked as an illustrator and theatre set designer in Sydney before joining Ernest Wunderlich to work on the design of pressed metal and other decorative materials. He personally decorated a small number of interiors including the Singer showrooms in Melbourne (1889) and Sydney (1891).

Godwin, Edward William (1833-1886): Architect and Designer.
One of the most brilliant and original designers of his

generation. Responsible for the decoration of a number of domestic interiors. He chose wallpaper, designed furniture and supervised mixing of paint. He even selected pictures and ornaments for the interior finishing of his projects.

Gow, Charles (c.1845-c.1892): Decorator.
Served a six year apprenticeship in stained glass with John Cairney in Glasgow from 1859. Worked as a journeyman painter for several years then joined Daniel Cottier in 1867. During the twelve years he spent with Cottier he served in the business in Glasgow, London, Sydney and possibly also Adelaide. He is probably the most outstanding of the design talents whom Cottier sent out to work with John Lyon. In 1879 he returned to his home in Glasgow and formed a partnership with Hugh McCulloch. The business flourished over the following decade with church work, public and commercial buildings, and steamers and yachts. He acquired the goodwill of Andrew Wells business in 1886 when Wells left Glasgow for Sydney. In 1891 he set out for Adelaide to re-establish his association with Lyon and Cottier.

Grice, B.J. (c.1860-c.1940): Decorator.
A very successful decorator whose knowledge was acquired wholly within Australia. He was apprenticed to Lyon, Cottier and Co in the late 1870s. From there he established his own business which became the largest private employer of painters in New South Wales during the first decade of the twentieth century.

Guthrie, J.and W. Painters and Decorators.
John, James and William Guthrie developed a very successful decorating business in Glasgow which flourished through the 1870s and into the new century. In 1884 stained glass was added to the business in order to enable them to make a good showing at the 1886 Edinburgh Exhibition. In 1896 Andrew Wells joined the firm upon his return from Australia.

Haité, George Charles (1855-1954): Designer.
One of the most successful of late Victorian textile designers. He had considerable influence in Aesthetic circles. His work included designs for metalwork, wallpapers as well as textiles for firms like Warner and Sons, Baker and Jeffrey.

Hay, David Ramsay (1796-1866): Painter and Decorator.
Born in Edinburgh where he set up his business in 1828; he was responsible for the uplifting of the house-painting trade in the early decades of the nineteenth century. Having served an apprenticeship with David Roberts and James Ballantine at Gavin Beugo's he went on to form a painting business in partnership with William and George Nicholson which was shortlived. He undertook many important decorating commissions and trained an important band of young decorators. His greatest contribution was the publication of books, including The Laws of Harmonious Colouring (1828) and A Nomenclature of Colours (1846).

Heaton, Butler and Bayne Artists and Decorators.
Clement Heaton (1824-82) and James Butler (1830-1913) became partners in 1855 and were joined by Robert Turnill Bayne (1837 - 1915) in 1862. The business passed on to their sons Clement John Heaton, Clement James Butler, Richard Cato Bayne and Basil Richard Bayne. Major works include Eaton Hall, Cheshire (1885).

Henry, Lucien (1850-1896): Designer.
Received a formal art training in Paris under Viollet-le-Duc and at the *Ecole de Beaux Arts*. He arrived in Sydney in the late 1870s and became involved in art education. His greatest contribution was in the promotion of Australian flora and fauna in decorative design work.

Hope, Thomas (1769-1831): Designer.
Thomas Hope influenced the development of classical taste in England with the display of his collections in his own Duchess Street, London house. His Household Furniture and Interior Decoration (1792) helped to spread the Neo-Classical style.

Hulme, Frederick Edward (1841-1901): Draughtsman and Writer, Designer and Teacher.
He trained at the South Kensington Schools and contributed important works on heraldry, ornament and symbolism in Christian art. He wrote Principles of Ornamental Art (1875) and Suggestions in Floral Design (1881).

Hunt, John Horbury (1838-1904): Architect.
One of the very colourful characters of Australian architecture. Born in North America, he commenced working in Sydney with Edmund Blacket in 1863. In a short space of time he assumed responsibility for all of Blacket's country work and soon branched out on his own with the

same clients. He regularly incorporated painted decorations in the finishing of his buildings. His most important projects include, St Peter's Cathedral, Armidale (1871); All Saints, Hunters Hill, Sydney, (1885); and 'Booloominbah', Armidale, (1887).

Johnson, Parnell W. (1851-1911): Decorator and Instructor. Arrived in Sydney from Lancashire in 1881 and commenced work with Lyon, Cottier and Co. One of first projects with that firm was the interior decoration of 'The Abbey', Sydney where his pencilled initials appear on some bold Gothic Revival furniture which he probably designed and painted. He established classes in painting and decorating at the Sydney Technical College in 1883 and continued to teach decorative art there into the new century. He became, in 1906, a regular contributor to The Australasian Decorator and Painter.

Jones, Owen (1809-1874):.Designer, Decorator and Writer. One of the giants of nineteenth-century ornament. He studied the ornament of other civilisations and he published the highly influential Grammar of Ornament in 1856. His early work involved the decoration of interiors and writing.

Kershaw, Thomas (born 1819): Painter and Decorator. Served a tough apprenticeship with a Bolton house-painter before moving to London where he studied marbling part-time. Later he set up his own lucrative practice.

Lavers and Barraud, Stained Glass Designers and Decorators. Nathaniel Lavers (1828-1911) established a glass staining business in London in 1855. Francis Barraud (1824-1900) joined him in 1858 and N.J.Westlake (1833-1921) joined them around 1860. Westlake had taken up glass staining at the suggestion of William Burges but he retained and developed the skills of decorative painting which he employed in works such as the outstanding triptych in Bishops Court, Devon, painted in 1863.

Lenehan, Andrew (c.1815-86): Upholsterer and furniture Maker. Andrew Lenehan was a very influential decorator in Sydney. The majority of his work was in furniture design. He employed a large team of craftsmen.

Leiper, William (1839-1916): Architect. Trained in Glasgow then moved to London to work before returning to Glasgow to work with Campbell Douglas and J.J.Stevenson. In Glasgow he worked closely with the

decorators, Daniel Cottier and Andrew Wells. Together they produced outstanding work, including the Dowanhill Church (1865) and 'Cairndhu' House (1867).

Liberty, Arthur Lazenby (1843-1917): Decorators Supplier.
A leading figure in the Art Movement and *L'Art Nouveau*. His involvement in the formation of taste in decoration was felt strongly in Europe where the modern style of sinuous line and organic forms took his name.

Loudon, John Claudius (1783-1843): Author.
Compiled an encyclopaedia which was significant in the promotion of the work of decoration and particularly D.R.Hay and his work.

Lyon, John Lamb (1839-1916): Stained Glass Artist and Decorator.
The most important of the Australian decorators. His early training in glass staining in Glasgow and London was orthodox. He moved to Australia and designed mostly Gothic styled glass before his return to Glasgow and the brief reunion with successful Scottish designers led him to form a nominal partnership with Daniel Cottier which became a magnificently productive career in decorative painting and Aesthetic decoration in Sydney and Melbourne.

Mackintosh, Charles Rennie (1868-1928): Architect and Designer.
One of the most remarkable architects of his day. His studies at the Glasgow Art School and a scholarship to travel in Italy preceded an outstanding career in which he established a new design style which spread to every contemporary form of decorative art in Glasgow. The Glasgow style was emulated on the continent. As a user of painted decorations, Mackintosh made a contribution to the development of modern interior decorations.

Marshall, Walter Crawford (c.1845-1909): Decorator.
Although primarily a worker in stained glass, undertook painting and decorating. A native of Glasgow, he resided in Victoria for a time then settled in Sydney about 1879 where he worked with Lyon, Cottier and Co. He commenced business on his own account in Sydney about 1890.

Morris, Marshall, Faulkner and Co.: Decorators and Manufacturers.
William Morris (1834-1896) founded the Firm in 1861 with Philip Webb, Ford Madox Brown, Burne-Jones and Rossetti. The Firm was reconstituted as Morris and Company in 1875. Although stained glass and furniture were the principal commercial products the partnership was formed through

collaboration on decorative painting exercises and from there it grew to include all forms of decorative art, particularly wallpapers and fabrics.

Nesfield, William Eden (1835-1888): Architect.
An outstanding architect and pioneer of the eclectic Queen Anne style. His partnership during the 1860s with Norman Shaw was very significant to the development of the new style.

Parry, Thomas Gambier (1816-88): Landowner and Painter
Gambier Parry was a keen ecclesiologist with an interest in art and painting techniques. He closely studied the traditional fresco masters and their techniques. He developed a spirit fresco technique which he used in some highly significant painting of his own, including the ceiling of Ely Cathedral (1862). His main contribution was to introduce a spirit fresco technique capable of withstanding the effects of the English climate.

Paterson Brothers: Painters and Decorators.
Charles Stewart Paterson (1843-c.1900) established the family business in Melbourne soon after arriving from Edinburgh in 1872. His brothers James and Hugh joined Charles in the family business in the 1870s. Their important works include VIlla Alba (1883-84) and Government House, Melbourne (1889-90)

Pearson, John Loughborough (1817-1898): Architect.
Belgian-born architect associated with late Gothic Revival. Although his work was inspired by northern French examples he used coloured brickwork and painted decorations to good effect. His important works include St Peter's, Vauxhall (1860) and St Augustine's, Kilburn (1871).

Pugin, Augustus Welby Northmore (1812-1852): Designer.
The giant of the revival of mediaeval design. He discovered the intimate secrets of mediaeval design through first-hand study. Following his father's death Pugin published the drawings they prepared together. He was converted to Roman Catholicism and dedicated his life to the revival of mediaeval art. He designed and decorated a prodigious number of churches, collaborated with Charles Barry on the decorations of the Houses of Parliament, founded and developed a business in stained glass, furniture and decorative items, and wrote several highly significant books, including, Contrasts (1836), Glossary of Ecclesiastical Ornament (1846), Floriated Ornament (1849) and True Principles (1851).

Roberts, David (1976-1864): Painter.
An outstanding artist whose early life and work were associated with the development of the house-painting trade in Scotland. At twelve years of age he was apprenticed to an Edinburgh house-painter for two shillings per week. His art developed through scene painting and it flourished with travels in the East. His paintings and journals were influential in spreading ideas about polychromatic decorations as he observed them in the East. His friendship with David Hay was highly significant.

Rossetti, Dante Gabriel (1828-1882): Artist.
A principal member of the pre-Raphaelite Brotherhood and founder member of Morris, Marshall, Faulkner and Co. His influence over Morris and many other young designers and artists of the period was highly significant. It was Rossetti who introduced Morris, Burne-Jones and others to painted decorations.

Ruskin, John (1819-1900): Art Critic.
One of the most influential art critics of the nineteenth century. His interest in buildings, and his writings on the subject of decoration, helped to shape public architecture during the mid-nineteenth century.

Scott, George Gilbert (1811-1878): Architect.
The outstanding figure of the mainstream Gothic Revival. His 850 known works include many fine decorated interiors. His office employed and trained many of the young talents who also contributed handsomely to the dissemination of decorative skills. He persuaded Alfred Bell, a pupil, to go into decorating and he remained faithful to his judgement by employing Clayton and Bell , and many more promising young decorators to produce stained glass and decorations for many of his works.

Sellars, James (1843-1888): Architect.
Practised architecture in Glasgow with Campbell Douglas during the 1870s. He was friendly with the two leading decorative designers of the 1860s and 1870s, Alexander Thomson and Daniel Cottier. Their influence led to Sellars' interest in painted decorations which became an important feature of his architecture.

Shaw, Richard Norman (1831-1912): Architect.
The dominant architectural personality of the last decades of the nineteenth century. His close association with the Aesthetic Movement led him into a partnership with Aldam

Heaton for whom he designed stained glass, carpets, wallpapers and furniture.

Smith, James Moyr: Architect, Decorative Designer and Writer. Trained as an architect in the office of James Salmon in Glasgow. He later moved into writing and publishing in the subject area of interior decorations. His most significant publications being the monthly journal Decoration and a book called Ornamental Interiors, (1887). He also designed decorative architectural features such as ceramic tiles.

Stevenson, John James (1831-1908): Architect.
One of the leading architects working in the vernacular revival style during the 1870s and 1880s. After training in Scott's office in London he returned to Glasgow and formed a partnership with Campbell Douglas. He returned to London in 1870 where he came into closer contact with Brydon, Cottier, Rossetti and Morris. His style moved towards Queen Anne and Aestheticism for which he became widely recognised.

Street, George Edmund (1824-1881): Architect.
The leader of the High Victorian generation of British Architects. His early training in the office of Gilbert Scott brought him into contact with many talented designers like Alfred Bell and George Bodley. He travelled in Spain and Italy where he developed strong ideas about ecclesiology and polychromatic decoration which then shaped his architecture. He brought young designers into his office, including Norman Shaw, William Morris and Philip Webb. who, together, made a huge contribution to art and architecture of the late nineteenth century.

Talbert, Bruce J. (1838-81): Designer and Ornamentist.
One of the outstanding talents of the nineteenth-century revival of the Decorative Arts. Born in Dundee, he trained as a woodcarver and architect. He worked for Campbell Douglas and J.J.Stevenson in Glasgow then as a furniture designer in London. He was involved with Wallace and Brydon in the establishment of Daniel Cottier's decorating and furnishing business in London around 1870. His very influential publications were Gothic Forms Applied to Furniture, Metalwork and Decoration for Domestic Purposes, (1867) and Examples of Ancient and Modern Furniture, Metalwork, Tapestries, Decoration Etc. (1876).

Thomson, Alexander (Greek) (1817 - 75): Architect.
An outstanding figure in Glasgow where he maintained a tradition of Egyptian-inspired classical design. He was an

early patron of Daniel Cottier who decorated his early churches. His great works include Queen's Park United Presbyterian Church, Glasgow (1867).

Vernon, Walter Liberty: Architect.
New South Wales Colonial Architect from 1891 to 1914. He was responsible for the introduction of Australian floral and fauna motifs to the decoration of public buildings.

Viollet-le-Duc, Eugene Emmanuel (1814 - 1879): French Architect.
A passionate restorer of mediaeval cathedrals following his appointment as director of the restoration of *Sainte Chapelle*, Paris. He learned a great deal about mediaeval painted decorations and he demonstrated a flair for large scale decorations. From 1853 to 1869 he worked on the publication of his *Dictionaire Raisonne de l'Architecture Francaise* which did much to promote French Gothic design. He made an outstanding contribution in his work in *Notre Dame de Paris* (1845-5).

Voysey, Charles F.A. (1857-1941): Architect.
Trained in the office of J.P.Seddon. In 1882 he established his own practice in Westminster in which he developed a decorative architectural style of his own based on free forms and sinuous decorative devices - the Voyseyan style. He was one of the first to design buildings from within outwards.

Walton, George (1867-1933): Designer and Decorator.
Glasgow-born son of a painter. Although his early professional career was in banking, he turned to interior decorating in 1888. He developed a style of design which is today recognised as the Glasgow style, which he successfully applied in Britain and Europe.

Wallace, William: Architect.
Glasgow-born, he worked closely with Daniel Cottier and J.M.Brydon early in their careers. They joined with Talbert in the formation of the art furnishing and decorating business in London in 1869.

Waring, John Burley (1823-75): Architect and Writer.
J.B.Waring become more interested in ornament than architecture. He worked with M.D.Wyatt and Owen Jones, contributing some of the text of the Grammar of Ornament. He was involved in the preparation of guide books for the Crystal Palace Exhibition, Sydenham.

Wells, Andrew (1844 - 1918) : Artist and Decorator.
An early pupil of Daniel Cottier. In 1869 he established a business in Glasgow, which he abandoned in 1886 to join John Lyon in Sydney. He returned to Glasgow in 1896 with his sons whom he had trained in Australia. In 1897 he re-established his former business then amalgamated with J and W.Guthrie. This successful venture continued well after Wells retirement around 1910. His important works include St Andrews Hall, Glasgow, (for Douglas and Sellars), St Andrews Church, Glasgow, completed before he departed for Australia, Sir George Verdon's residence, the E.S.and A. Bank, Melbourne (1887) and the New South Wales Club, Sydney, (1887).

Westlake, N.J.: Artist.
See Lavers and Barraud.

White, William (1825-1900): Architect.
Trained with Street and Bodley in the office of Gilbert Scott before setting up his own practice in Cornwall. He became involved in projects with Owen Jones through which he developed his interest in painted decorations although his interest was not confined to uniquely classical models. His painted interiors at Bishops Court, Devon, feature very fine High Victorian Gothic Revival furniture and decorations.

Willement, Thomas (1786 - 1871): Designer and Glass Artist.
A pioneer in stained glass and a notable heraldic artist. During has very long career he undertook major decorating commissions in England and is today recognised, together with Pugin, as a major influence in the Renaissance of stained glass and decorations in the mediaeval style. His important decorative works include Charlecote Park, Warwickshire, (1831) Great Hall, Library & Dining Room.

Wornum, Ralph Nicholson (1812 - 77): Painter and Art Critic.
Studied painting and worked as a portrait painter before commencing lecturing in 1848 on the history of ornament at the Government School of Design. His Analysis of Ornament was published in 1882.

Wyatt, Matthew Digby (1820-1877): Architect and Designer.
A member of the distinguished family of painters and designers. His interest was in the historical styles.

APPENDIX E
SELECT BIBLIOGRAPHY

1. Primary Sources

Ballantine, James. "The Life of David Roberts Compiled from his Journals and Other Sources". Edinburgh 1866.

Campbell, Kenneth. "A Century of Decorative Craftsmanship, 1873-1973". London: Campbell Smith and Company, 1973.

Dobie, George and Son. Papers and Press Notices. The Royal Commission on the Ancient and Historical Monuments of Scotland Archives.

Great Britain and Ireland Commissioners of the Fine Arts Select Committee Report, I, 1841.

Industrial Progress of New South Wales, being a Report of the Intercolonial Exhibition of 1870 at Sydney.

Jones, Owen. "On the Decorations Proposed for the Exhibition Building, in Hyde Park". Read at the Ordinary General Meeting of the Royal Institute of British Architects, 16 December 1850.

McCulloch, H. esq. Newscuttings collected by Strathclyde Regional Archives, Glasgow.

Post Office Glasgow Directory

Roberts, David. Egypt and Nubia, from drawings made on the spot. London: F.G.Moran, 1846.

Simpson, A.L. In Memorium: Thomas Bonnar. Edinburgh: 1876. (Mitchell Library, Glasgow).

2. Documents and Records

Anderson Drawings. A Collection of 29 Drawings by J.Ross Anderson. Melbourne College of Decoration.

Guthrie and Wells. Design papers, Peoples Palace, Glasgow Museums and Art Galleries.

Records of Guthrie and Wells. Strathclyde Regional Archives, Glasgow.

Lyon and Stowe Family Papers 1880-1936. Mitchell Library, Sydney.

The Royal Commission on the Ancient and Historical Monuments of Scotland. Archives. Photographs of Decorations.

Specification by David Ramsay Hay of a New Process in Painting for Producing the Appearance of Damask, 1827. R.C.A.H.M.S., Edinburgh.

Specification by David Ramsay Hay of Painting Proposed to be done at Milton Drawing Room, 1829. Scottish Record Office, Edinburgh.

3. Selected Books

Anscombe, Isabelle, and **Gere**, Charlotte. Arts and Crafts in Britain and Australia. London: Academy Editions, 1978.

Aslin, Elizabeth. The Aesthetic Movement, prelude to Art Nouveau. London: Ferndale, 1981

Baldry, A.Lys. Modern Mural Decoration. London: George Newnes, 1902.

Billecliffe, Roger. Charles Rennie Mackintosh: the Complete Furniture, Furniture Drawings and Interior Designs. London: Butterworth, 1979.

Brommelle, Norman, and **Smith**, Perry. Conservation and Restoration of Pictorial Art. London: Butterworths, 1976.

Boase, T.S.R. ed. The Houses of Parliament. London: Yale University Press, 1976.

The Central Council for the Care of Churches. The Conservation of English Wallpaintings

Christie, Archibald H. Traditional Methods of Pattern Designing. Oxford: Clarendon Press, 1910; reprint ed., titled, Pattern Design. New York: Dover, 1969.

Clark, Kenneth. The Gothic Revival, An Essay in the History of Taste. London: John Murray, 1928.

Cooper, Jeremy. Victorian and Edwardian Furniture and Interiors. London, Thames and Hudson, 1987.

Cunningham, Colin. Victorian and Edwardian Town Halls. London: Routledge & Kegan Paul, 1981.

Crace, John D. The Art of Colour Decoration. London: B.T. Batsford, 1912

Croft-Murray, E. Decorative Painting in England 1537-1837. 2 Vols. London: Country Life, 1962

Crossley, Fred H. The Glory that was England, English Church Craftsmanship. London: B.T. Batsford, 1941.

Crook, J.Morduant. William Burges and the High Victorian Movement. London: John Murray, 1981

Curl, James S. The Egyptian Revival. London: George Allen and Unwin, 1982.

Durant, Stuart. Ornament: From the Industrial Revolution to Today. New York: The Overlook Press, 1986.

Feibusch, Hans. Mural Painting. London: Adam and Charles Black, 1946.

Forge, Suzanne. Victorian Splendour: Australian Interior Decoration 1837-1901. Melbourne: Oxford University Press, 1981.

Freeland, J.M. Architect Extraordinary: The Life and Work of John Horbury Hunt: 1838-1904. Melbourne: Cassell Australia, 1970.

Germann, Georg. Gothic Revival in Europe and Britain: Sources, Influences and Ideas. Translated by Gerald Onn. London: Lund Humphries, 1972.

Gettens, Rutherford J. and **Stout**, George L. Painting Materials (A Short Encyclopaedia). London: Van Nostrand, 1942; reprint ed., New York: Dover, 1966.

Girouard, Mark. Sweetness and Light (The Queen Anne Movement 1860-1900).Oxford: Clarenden Press, 1977; reprint ed., London: Yale, 1984.

Harley, R.D. Artists Pigments c.1600-1835 (A Study in English Documentary Sources).London: Butterworths, 1970.

Harrison, Martin. Victorian Stained Glass. London: Barrie and Jenkins, 1980.

Hasluck, Paul N. Ed. Cassell's House Decoration - A Practical Guide to Painter's and Decorator's Work. London: Cassell and Co., 1910.

Heaton, Noel. Outlines of Paint Technology.London: Griffin, 1928.

Hulme, F.Edward. Symbolism in Christian Art. London: Swan Sonnenschein, 1910.

Kerr, Joan, and Broadbent, James. Gothick Taste in the Colony of New South Wales. Sydney: The David Ell Press, 1980.

Rodwell, Warwick, and **Bentley**, James. Our Christian Heritage. London: George Phillip, 1984.

McFadzean, Ronald. The Life and Work of Alexander Thomson. London Routledge and Kegan Paul, 1979.

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

Muthesius, Stefan. The High Victorian Movement in Architecture 1850-1870. London: Routledge and Kegan Paul, 1972.

Port, M.H. Six Hundred New Churches A Study of the Church Building Commission, 1818-1856, and its Church Building Activities. London: The Church Historical Society, 1961.

Idem. The Houses of Parliament. London: The Paul Mellon Centre for Studies in British Art, 1976.

Rodwell, Warwick, and **Bentley**, James. Our Christian Heritage. London: George Phillip, 1984.

Smith, Helen. Decorative Painting in the Domestic Interior in England and Wales c.1850-1890. London: Garland, 1984.

Stanton, Phoebe. Pugin. London: Thames and Hudson, 1971.

Thompson, Paul. William Butterfield. Cambridge Massachusetts: The M.I.T. Press, 1980.

Thornton, Peter. Authentic Decor: The Domestic Interior 1620-1920. London: Weidenfeld and Nicholson, 1985.

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

4. Nineteenth-Century Reference Books

Arrowsmith, H. & A. The House Decorator and Painter's Guide. London: Thomas Kelly, Paternoster Row, 1840.

Audsley, W. and G. Polychromatic Decoration in the Medieval Styles. London: Henry Southeran & Co, 1882.

Audsley, W.and G. Outlines of Ornament in the Leading Styles. London: 1881.

Audsley, G.A.& M.A. The Practical Decorator and Ornamentist. Glasgow: Blackie and Son, 1892.

Audsley, G.A.& W.J. Popular Dictionary of Architecture and the Allied Arts. 3 Vols. Liverpool: 1878.

Ballantine, James. A treatise on Painted Glass Shewing its Application to Every Style of Architecture. London: Chapman and Hall, 1845.

Idem. Essay on Ornamental Art as Applicable to Trade and Manufactures. London: W.S.Orr, 1847.

Batley, W.H. A Series of Studies for Domestic Furniture and Decoration. 1883

Capes, Alfred. The Old and New Churches of London. London: Bumpus, 1880.

Chevreul, Michel Eugene. *De la Loi du Contraste Simultané des Couleurs*. Paris: Pitois-Levrault, 1839. Translated as The Laws of Contrast of Colour: and their Application to the Arts of Painting, Decoration,of Buildings, Mosaic Work, Tapestry and Carpet Weaving. London: Routledge, Warnes and Routledge, 1839.

Idem. The Principles of Harmony and Contrast of Colours and their Applications to the Arts. Translated from the French by J.Spanton. London: 1854.

Church, A.H. The Chemistry of Paints and Painting. London: Seeley and Co. 1890.

Cottier. Collection Cottier Catalogue. London: T.A.Constable, 1892.

Colling, James K. Art Foliage for Sculpture and Decoration, Second Edition. London: B.T. Batsford, 1878.

Cook, Clarence. The House Beautiful. New York: Scribner, Armstrong and Company, 1878.

Crane, Lucy. Art and the Formation of Taste. London: MacMillan, 1882.

Cutler, Thomas W. A Grammar of Japanese Ornament and Design. London: B.T.Batsford, 1880.

Daly, César. L'Architecture Privée au XIX^{eme} Siecle, 3 Vols. Paris: 1864.

Day, Lewis F. The Anatomy of Pattern. London: B.T.Batsford, 1887.

Idem. Lewis F. Nature in Ornament. London: B.T.Batsford, 1894.

Dresser, Christopher. Principles of Decorative Design. London: Cassell Petter and Galpin, 1873.
Idem. Modern Ornamentation. London: B.T.Batsford, 1886
Idem. Studies in Design. London: Cassell, Petter and Galpin, 1874.
Eastlake, Charles Lock. Contributions to the Literature of the Fine Arts. London: John Murray, 1870.
Idem. Hints on Household Taste. London: Longmans, Green and Co., 1878.
Edis, Robert W. Decoration and Furniture of Town Houses. London: C.Kegan Paul, 1881.
Goethe, Johann Wolfgang von. Theory of Colours. Translated with notes by Charles Lock Eastlake. London: John Murray, 1840.
Haweis, Mary Elisa. Beautiful Homes (Being a Description of Certain Well-known Artistic Houses). London: Samson, Low, Maston, Searle and Rivington, 1882.
Hay, David Ramsay. Original Geometrical Diaper Designs accompanied by an Attempt to Develop and Elucidate the True Principles of Ornamental Designs as Applied to the Decorative Arts. London: D.Bogue, 1844.
Idem. A Nomenclature of Colours. Edinburgh: William Blackwood and Sons, 1846.
Idem. The Laws of Harmonious Colouring Adapted to Interior Decorations with Observations on the Practice of House Painting. Edinburgh: William Blackwood and Sons, 1847.
Hulme, F.Edward. Art Studies From Nature. London: Virtue and Co., 1872.
Idem. Principles of Ornamental Art. London: Cassell, Petter and Galpin, 1875.
Idem. Suggestions in Floral Design. London: Cassell, Petter and Galpin, 1881.
Jones, Owen. Plans, Elevations and Sections of the Alhambra. 2 Vols. London: 1842-45.
Idem. The Grammar of Ornament. London: Day and Son, 1856.
Kempt, Robert. What Do You Think of the Exhibition (A Collection of the Best Descriptions and Criticisms, from the Leading Journals concerning the International Exhibition). London: James Hogg and Sons, 1862.
Kerr, Robert. The Gentleman's House or How to Plan English Residences from the Parsonage unto ... the Palace. 2nd Ed. London: John Murray, 1865.
Loudon, J.C. An Encyclopaedia of Cottage, Farm and Villa Architecture and Furniture. London: Longman, Rees, Orme, Brown, Green and Longman, 1836.
Masury, John W. How Shall We Paint our Houses? A Treatise on the Art of House-Painting: Plain and Decorative. New York: D.Appleton and Co., 1868.

Miller, Fred. Interior Decoration: A Practical Treatise on Surface Decoration, with Notes on Colour, Stencilling, and Panel Painting. Wyman's Technical Series, 1885.

Merrifield, Mary. The Art of Fresco Painting, London: John Murray, 1846.

Idem. Original Treatises ... on the Art of Painting. London: John Murray, 1849.

Meyer, Franz Sales. Handbook of Ornament: a Grammar of Art Industrial and Architectural Designing in All Its Branches. London: Constable, 1896.

Moyr Smith. See Smith, J.Moyr.

Pugin, Augustus Welby Northmore. Floriated Ornament, a Series of 31 Designs. London: 1849.

Idem, Contrasts, or a Parallel between the Noble Edifices of the Fourteenth and Fifteenth Centuries, and Similar Buildings of the Present Day: showing the Present Decay of Taste. London: 1836

Idem, Glossary of Ecclesiastical Ornament and Costume, compiled from Ancient Authorities and Examples,. 1846.

Smith, George. A Collection of Designs for Household Furniture and Interior Decoration. London: J.Taylor, 1808.

Idem. Cabinet-Maker's and Upholsterer's Guide, Drawing Book, and Repository of New and Original Designs for Household Furniture and Interior Decoration in the Most Approved and Modern Taste. London: Jones and Co., 1826.

Smith, J.Moyr. Ornamental Interiors. London: Crosby Lockwood, 1887.

Taylor, J.Scott. Field's Chromatography: A Treatise on Colours and Pigments for the Use of Artists. London: Windsor and Newton, 1885

Thomas, W.Cave. Mural or Monumental Decoration. London: Windsor and Newton, 1869

Vanherman, T.T. Everyman His Own House-Painter and Colourman. London: I.F.Setchell, 1829.

Ward, James. Elementary Principles of Ornament. London: Chapman and Hall, 1890

Idem. The Principles of Ornament. London: Chapman and Hall, 1899.

Waring, John Burley. Illustrations of Architecture and Ornament. London: Day and Son, 1865.

Whittock, Nathaniel. The Decorative Painter's and Glazier's Guide. London: 1827; reprint ed., Sherwood, Gilbert and Piper, 1841.

5. Catalogues, Articles, Theses and Essays

Bristow, Ian C. "Interior House-Painting from the Restoration to the Regency", in 2 Volumes. D.Phil. dissertation, University of York, 1983.

Crane, Walter. "Of the Decoration of Public Buildings". Second Lecture given in the Autumn of 1896. The Arts and Crafts Exhibition Society.

Darby, Michael. "The Islamic Revival 1830-1970: Polychromy, Geometry and Aesthetics". The Roger Dixon Memorial Lecture Delivered at the Polytechnic of the South Bank, 6 June 1985.

Idem. The Islamic Perspective: An Aspect of British Architecture and Design in the Nineteenth Century. London: World of Islam Festival Trust, 1982.

De Jong, Ursula M. William Wilkinson Wardell: His Life and Work: 1828-1899. Melbourne: Monash University, 1983.

The Department of Decorative Art. The Glasgow Style 1890-1920. Glasgow: Glasgow Museums and Art Galleries, 1984.

Dickie, Rev. William. History of Dowanhill Church 1823-1923. Glasgow 1926.

Donnelly, Michael. Glasgow Stained Glass. Glasgow: Glasgow Museums and Art Galleries, 1981.

Gage, John. George Field and His Circle: From Romanticism to the Pre-Raphaelite Brotherhood. Cambridge: Fitzwilliam Museum, 1989.

Gould, Brian. Two Van Gogh Contacts:- E.J.Van Wisselingh, Art Dealer; Daniel Cottier, Glass Painter and Decorator. London: Naples Press, 1969.

Gow, Ian. "David Ramsay Hay" (Public Lecture). Edinburgh: 1984.

Idem. "A Stencilled Room and a Painted Floor. The Archaeology of Edinburgh's New Town". The Scottish Georgian Society for the Study and Protection of Scottish Architecture. Annual Report 1981 Bulletin No.8, September 1981.

Guiterman, Helen, and **Llewellyn**, Briony. David Roberts. London: Phaidon Press and Barbican Art Gallery, 1986.

Gurney, George. "Olin Levi Warner (1844-1896): A Catalogue Raisonné of His Sculpture and Graphic Works". Ph.D.dissertation, University of Delaware, 1978.

Harris, John. Headfort House and Robert Adam. London: Royal Institute of British Architects, 1973.

Hay, D.R. "An Essay on Ornamental Design with an Attempt to Develop its Principles and to point out an Easy Method of Acquiring Facility in its Practice". London: 1844.

Kinchin, Juliet. "The Wylie and Lochhead Style". Decorative Arts Society Journal 9. 1984.

Larkworthy, Peter. Clayton and Bell, Stained Glass Artists and Decorators. London: The Ecclesiological Society, 1984.

Macready, Sarah, and **Thompson**, F.H., ed. Influences in Victorian Art and Architecture, London: The Society of Antiquaries of London, 1985.

Mavor, James. My Windows on the Street of the World. London: J.M.Dent and Co., 1923.

Parker, W.M. Dobie and Son Ltd 1849-1949. Edinburgh: R. and R. Clark Ltd, 1949.

Robertson, Denise. 'John Lamb Lyon: His Life and Work'. B.Arch. dissertation, 1988.

6. Newspapers and Journals

The Architect
The Art Worker's Quarterly
The Australasian Decorator and Painter[1]
The British Architect
The Building, Engineering and Mining Journal
The Builder and Contractor's News
The Cabinet Maker and Art Furnisher
The Conservator
Country Life
Decoration[2]
The Decorative Art Journal
The Decorator[3]
The Decorator's Assistant[4]
The Decorator and Furnisher[5]
The Ecclesiologist
The Edinburgh Evening Courant
Glasgow Evening Times
Glasgow Herald
The Journal Of Decorative Art[6]
The Scotsman
The Studio
The Sydney Morning Herald
The World of Interiors

---

[1]Later The Decorator and Painter for Australia and New Zealand.

[2]Decoration in Painting,Sculpture, Architecture and Art Manufactures. London: Marsten, Searle & Rivington, 1880, and, Decoration in Painting and Sculpture, Architecture and Art Manufactures. London, Sampson Low Marsten & Rivington, 1881-86. New Series..

[3]The Decorator (An Illustrated Practical Magazine and Advertiser for the Furnishing Trades Including Cabinet Makers ... Paperhangers, House Painters and Glaziers. London: A.C.Hailes, 1864-5.

[4]The Decorator's Assistant and Weekly Record of Painting, Sculpture, Architecture, Popular Science ... London: W.Gibbs, 1848-9.

[5]The Decorator and Furnisher. New York, E.W.Bullinger, 1882-3.

[6]The Journal of Decorative Art, An Illustrated Technical Journal for the House Painter, Decorator, and all Art Workmen. London: Henry Vickers 1881-c.1900.

APPENDIX F

THE BURRA CHARTER

The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance

Preamble

Having regard to the International Charter for the Conservation and Restoration of Monuments and Sites (Venice 1966), and the Resolutions of 5th General Assembly of the International Council on Monuments and Sites (ICOMOS) (Moscow 1978), the following Charter was adopted by Australia ICOMOS on 19th August 1979 at Burra Burra. Revisions were adopted on 23rd February 1981 and on 23 April 1988.

Definitions

Article 1. For the purpose of this Charter:

1.1 *Place* means site, area, building or other work, group of buildings or other works together with associated contents and surroundings.

1.2 *Cultural significance* means aesthetic, historic, scientific or social value for past, present or future generations.

1.3 *Fabric* means all the physical material of the *place.*

1.4 *Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance.* It includes *maintenance* and may according to circumstance include *preservation, restoration, reconstruction* and *adaptation* and will be commonly a combination of more than one of these.

1.5 *Maintenance* means the continuous protective care of the *fabric,* contents and setting of a *place,* and is to be distinguished from repair. Repair involves *restoration* or *reconstruction* and it should be treated accordingly.

1.6 *Preservation* means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

1.7 *Restoration* means returning the EXISTING *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

1.8 *Reconstruction* means returning a *place* as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the *fabric.* This is not to be confused with either re-creation or conjectural reconstruction which are outside the scope of this Charter.

1.9 *Adaptation* means modifying a *place* to suit proposed compatible uses.

1.10 *Compatible use* means a use which involves no change to the culturally significant fabric, changes which are substantially reversible, or changes which require a minimal impact.

Explanatory Notes

These notes do not form part of the Charter and may be added to by Australia ICOMOS.

Article 1.1
Place includes structures, ruins, archaeological sites and landscapes modified by human activity.

Article 1.5
The distinctions referred to in Article 1.5, for example in relation to roof gutters, are:

maintenance — regular inspection and cleaning of gutters

repair involving restoration — returning of dislodged gutters to their place

repair involving reconstruction — replacing decayed gutters.

The Australia ICOMOS charter for the conservation of places of cultural significance was adopted at Burra in South Australia in 1979.

Conservation Principles

Article 2. The aim of *conservation* is to retain the *cultural significance* of a *place* and must include provision for its security, its *maintenance* and its future.

Article 2
Conservation should not be undertaken unless adequate resources are available to ensure that the fabric is not left in a vulnerable state and that the cultural significance of the place is not impaired. However, it must be emphasised that the best conservation often involves the least work and can be inexpensive.

Article 3. *Conservation* is based on a respect for the existing *fabric* and should involve the least possible physical intervention. It should not distort the evidence provided by the *fabric.*

Article 3
The traces of additions, alterations and earlier treatments on the fabric of a place are evidence of its history and uses.

Conservation action should tend to assist rather than to impede their interpretation.

Article 4. *Conservation* should make use of all the disciplines which can contribute to the study and safeguarding of a *place.* Techniques employed should be traditional but in some circumstances they may be modern ones for which a firm scientific basis exists and which have been supported by a body of experience.

Article 5. *Conservation* of a *place* should take into consideration all aspects of its *cultural significance* without unwarranted emphasis on any one aspect at the expense of others.

Article 6. The conservation policy appropriate to a *place* must first be determined by an understanding of its *cultural significance.*

Article 6
An understanding of the cultural significance of a place is essential to its proper conservation. This should be achieved by means of a thorough investigation resulting in a report embodying a statement of cultural significance. The formal adoption of a statement of cultural significance is an essential prerequisite to the preparation of a conservation policy.

Article 7. The conservation policy will determine which uses are compatible.

Article 7
Continuity of the use of a place in a particular way may be significant and therefore desirable.

Article 8. *Conservation* requires the maintenance of an appropriate visual setting: e.g., form, scale, colour, texture and materials. No new construction, demolition or modification which would adversely affect the setting should be allowed. Environmental instrusions which adversely affect appreciation or enjoyment of the *place* should be excluded.

Article 8
New construction work, including infill and additions, may be acceptable, provided:

it does not reduce or obscure the cultural significance of the place

it is in keeping with Article 8.

Article 9. A building or work should remain in its historical location. The moving of all or part of a building or work is unacceptable unless this is the sole means of ensuring its survival.

Article 9
Some structures were designed to be readily removable or already have a history of previous moves, e.g. prefabricated dwellings and poppet-heads. Provided such a structure does not have a strong association with its present site, its removal may be considered.

If any structure is moved, it should be moved to an appropriate setting and given an appropriate use. Such action should not be to the detriment of any place of cultural significance.

Article 10. The removal of contents which form part of the *cultural significance* of the *place* is unacceptable unless it is the sole means of ensuring their security and *preservation.* Such contents must be returned should changed circumstances make this practicable.

Conservation Processes

Preservation

Article 11. *Preservation* is appropriate where the existing state of the *fabric* itself constitutes evidence of specific *cultural significance*, or where insufficient evidence is available to allow other conservation processes to be carried out.

Article 11
Preservation protects fabric without obscuring the evidence of its construction and use.

The process should always be applied:

where the evidence of the fabric is of such significance that it must not be altered. This is an unusual case and likely to be appropriate for archaeological remains of national importance;

where insufficient investigation has been carried out to permit conservation policy decisions to be taken in accord with Articles 23 to 25.

New construction may be carried out in association with preservation when its purpose is the physical protection of the fabric and when it is consistent with Article 8.

Article 12. *Preservation* is limited to the protection, *maintenance* and, where necessary, the stabilization of the existing *fabric* but without the distortion of its *cultural significance.*

Article 12
Stabilization is a process which helps keep fabric intact and in a fixed position. When carried out as a part of preservation work it does not introduce new materials into the fabric. However, when necessary for the survival of the fabric, stabilization may be effected as part of a reconstruction process and new materials introduced. For example, grouting or the insertion of a reinforcing rod in a masonry wall.

Restoration

Article 13. *Restoration* is appropriate only if there is sufficient evidence of an earlier state of the *fabric* and only if returning the *fabric* to that state reveals the *cultural significance* of the *place.*

Article 13
See explanatory note for Article 2.

Article 14. *Restoration* should reveal anew culturally significant aspects of the *place.* It is based on respect for all the physical, documentary and other evidence and stops at the point where conjecture begins.

Article 15. *Restoration* is limited to the reassembling of displaced components or removal of accretions in accordance with Article 16.

Article 16. The contributions of all periods to the *place* must be respected. If a *place* includes the *fabric* of different periods, revealing the *fabric* of one period at the expense of another can only be justified when what is removed is of slight *cultural significance* and the *fabric* which is to be revealed is of much greater *cultural significance.*

Reconstruction

Article 17. *Reconstruction* is appropriate only where a *place* is incomplete through damage or alteration and where it is necessary for its survival, or where it reveals the *cultural significance* of the *place* as a whole.

Article 18. *Reconstruction* is limited to the completion of a depleted entity and should not constitute the majority of the *fabric* of a *place.*

Article 19. *Reconstruction* is limited to the reproduction of *fabric*, the form of which is known from physical and/or documentary evidence. It should be identifiable on close inspection as being new work.

Adaptation

Article 20. *Adaptation* is acceptable where the *conservation* of the *place* cannot otherwise be achieved, and where the *adaptation* does not substantially detract from its *cultural significance.*

Article 21. *Adaptation* must be limited to that which is essential to a use for the *place* determined in accordance with Articles 6 and 7.

Article 22. *Fabric* of *cultural significance* unavoidably removed in the process of *adaptation* must be kept safely to enable its future reinstatement.

Conservation Practice

Article 23. Work on a *place* must be preceded by professionally prepared studies of the physical, documentary and other evidence, and the existing *fabric* recorded before any intervention in the *place.*

Article 24. Study of a *place* by any intervention in the *fabric* or by archaeological excavation should be undertaken where necessary to provide data essential for decisions on the *conservation* of the *place* and/or to secure evidence about to be lost or made inaccessible through necessary *conservation* or other unavoidable action. Investigation of a *place* for any other reason which requires physical disturbance and which adds substantially to a scientific body of knowledge may be permitted, provided that it is consistent with the conservation policy for the *place.*

Article 25. A written statement of conservation policy must be professionally prepared setting out the *cultural significance* and proposed *conservation* procedure together with justification and supporting evidence, including photographs, drawings and all appropriate samples.

Article 25
The procedure will include the conservation processes referred to in Article 1.4 and other matters described in Guidelines to the Burra Charter: Conservation Policy.

Article 26. The organisation and individuals responsible for policy decisions must be named and specific responsibility taken for each such decision.

Article 27. Appropriate professional direction and supervision must be maintained at all stages of the work and a log kept of new evidence and additional decisions recorded as in Article 25 above.

Article 28. The records required by Articles 23, 25, 26 and 27 should be placed in a permanent archive and made publicly available.

Article 29. The items referred to in Articles 10 and 22 should be professionally catalogued and protected.

Words in italics are defined in Article 1.