

## CURRENT APPROACHES TO THE CONSERVATION OF ENGLISH WALL PAINTINGS SUFFERING FROM HISTORIC WAX TREATMENTS.

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Deterioration resulting from the 19<sup>th</sup> and early 20<sup>th</sup> century use of wax and wax/resin coatings for the treatment for wall paintings, remains one of the most complex and serious problems facing wall painting conservators in England. Not only is there the tendency for coatings of this type to discolour and obscure the paintings, but, more seriously, they block the porosity of the wall surface encouraging significant structural deterioration in cases where unstable environmental conditions are present.

Until relatively recently, the approach to the conservation of wall paintings treated in this way was to remove as much of the wax as possible using aggressive solvent techniques including commercial paint strippers. However, analysis of paintings treated in this way demonstrated not only that damage could easily be caused to the paint layer (which had often become intermingled with the wax coating) but also that the wax which had penetrated the paint and plaster layer was not removed by these treatments.

The availability of such analysis, and the general trend in the conservation world towards preventative approaches, means that there had now been a significant shift in emphasis away from the removal of wax as the automatic treatment for paintings in this condition. The current emphasis is increasingly on the accurate identification of the underlying causes of deterioration and the control of these factors in conjunction with the treatment of the paintings.

A project of this type was recently undertaken on the 14<sup>th</sup> century wall paintings in the north transept of St George's Church, Kelmscott, approximately 20km south west of Oxford. The paintings, which were first uncovered in the late 19<sup>th</sup> century, had been treated with a wax based consolidant in the 1930s. By the 1970s, the coating had darkened significantly, and flaking of the paint and plaster layers was observed in certain areas. Some areas of the paintings were treated at this time and the wax partially removed, but large areas were left untreated and the deterioration continued.

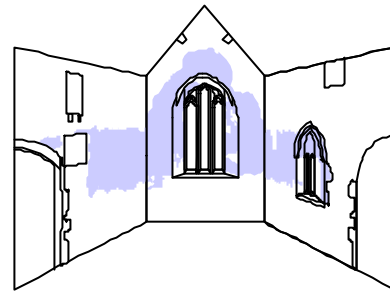


Figure 1. Expanded diagram of the north transept of St George's Church indicating the position of the exposed wall paintings



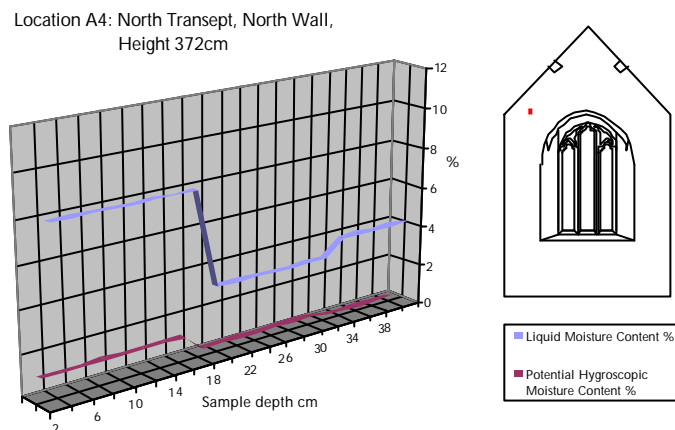
Figure 2. Detail of the painting on the west wall.  
(Photo: Tobit Curteis Associates 2000)

In 1994, the paintings were again examined and a programme of research was begun, in order to identify and control the underlying causes of deterioration. Once this had been carried out, the paintings were again treated in order to stabilise them and prevent further deterioration.

The first stage of the project was to carry out a thorough technical examination of the paintings, looking at their present condition, the rate of deterioration and the level to which the wax had penetrated the paint layer. Although the deterioration was serious in some areas, it was found that the penetration of the wax layer was relatively limited and, in general, the pigment and the wax were not intermingled.

In conjunction with the technical survey, a detailed study of the environmental conditions in the church was undertaken. The initial stage was to look at the liquid moisture conditions and the effect of rainwater and ground water. The first step in this type of survey is to examine the condition of the building envelope (that is the elements of the building structure which separate the internal and external environments), to ensure that water penetration cannot occur. In conjunction with this,

the rainwater goods (gutters, downpipes, drainage etc.) were investigated to ensure that rainwater was efficiently carried away from the building structure. In order to examine the moisture profile within the walls, core samples were taken from pre-determined sites and analysed for actual moisture content and potential hygroscopic moisture content (the level of moisture which may be due to hygroscopic materials such as soluble salts).

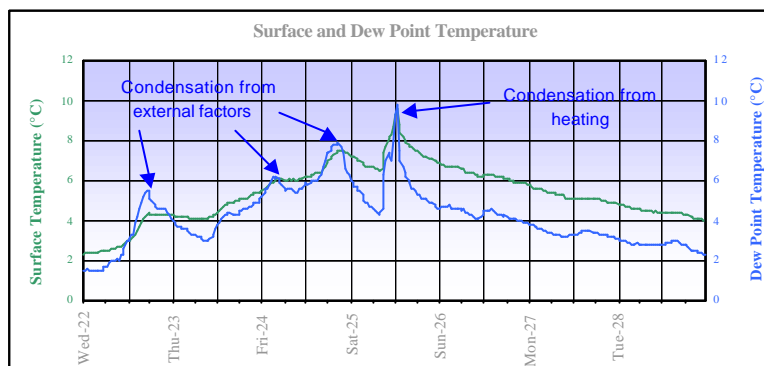


**Figure 3.** Moisture content of the core sample from the upper part of the north wall.

In conjunction with the liquid moisture survey, a study of the heating and ventilation systems was undertaken and a programme of environmental monitoring was instigated. The aim of this part of the survey was to establish how water vapour (as opposed to liquid moisture) was influencing the deterioration of the wall paintings. In order that seasonal variation (both weather conditions and building use) could be taken into account, the initial stage of the monitoring programme ran for twelve months.

The results of the liquid moisture survey showed that although there had been significant problems with capillary rise of ground water in the past, the current drainage system had reduced the height of the capillary rise to below the level of the surviving wall paintings. It was found that deterioration to the top of the paintings was still occurring due to damage at the junction between the roof and the gable wall. However, this was relatively easy to control by carrying out repairs to this part of the roof.

Of more concern were the results of the monitoring programme. This showed that while the church was well buffered and in general the internal microclimate was relatively stable, both the heating system and the high ventilation levels caused significant and damaging fluctuations in the conditions which regularly led to the formation of both superficial and interstitial condensation. This level of fluctuation in the internal relative and absolute humidities as well as the regular condensation, would inevitably increase the level of salt activity, accelerating the deterioration in both the paint and plaster layer.



**Figure 4.** graphs showing the periods in December 1999 when the dew point temperature rose above the surface temperature as a result of ventilation and heating.

Therefore, recommendations were made for the reduction in the level of deliberate ventilation and significant changes to the heating system (which at that time included portable gas heaters). The environmental conditions were then monitored for a further twelve months and the results demonstrated that the conditions, although by no means perfect, had improved noticeably.

The treatment of the paintings was carried out following the stabilisation of the internal environmental conditions. Due to the level of delamination between the paint and ground layers and, in some cases, between the plaster and the wall structure, it was in fact necessary to reduce the wax layer, to allow these areas to be treated. Following extensive testing, this was achieved using a xylene and white spirit mixture applied in a pappina (beeswax and water emulsion) support. It was accepted from the outset that although the wax had not penetrated deeply into the paint layer, the removal of the visible wax



**Figure 5.** Reduction of the wax layer using solvents supported in pappina. (Photo: Tobit Curteis Associates 2000)

would not significantly increase the porosity of the paint layer. Readhesion of the paint layer was undertaken using a weak solution of Plextol B500 applied through a Japanese tissue intervention layer and the plaster and wall structure was treated using lime putty based plasters and grouts.

While conservators can provide advice and, where necessary treatment, the long term conservation of wall paintings in churches such as these can only be achieved if the parish is aware of the measures which are necessary to prevent further deterioration. Therefore, included with the report on the conservation of the paintings, were a series of recommendations for the correct management of the building environment. It is hoped that if these measures are correctly implemented, the future deterioration of the paintings will be minimised.

Although none of the investigatory and treatment techniques employed in this project are in any way unique, what is unusual is the fact that techniques more usually associated with large and high profile projects are now being routinely applied to relatively small projects. This marks an important step forward in the approach to cases such as this, as it illustrates that the identification and control of the underlying causes of deterioration is now being taken as seriously as the treatment of the paintings. This is largely due to two factors: the availability of conservators trained in these techniques and the willingness of funding organisations to pay for proper investigations. The fact that over 90% of the wall paintings currently being treated have already been treated in the last 75 years demonstrates that, without proper identification and control of the causes of deterioration forming a core part of any conservation project, paintings will continue to decay.