

CHAPTER X

EXAMINATION AND ANALYSIS OF THE DEERHURST POLYCHROMY

by Emily Howe

A recent study of polychromy surviving on two carved animal heads in St Mary's church, Deerhurst, Gloucestershire, has shed important new light on the use of colour to embellish sculpture in the Anglo-Saxon period. The early ninth-century heads, which terminate the hood-moulding over the chancel arch (see catalogue: Deerhurst St Mary 18 and 19, pp. 183–5), were examined in the context of the rest of the surrounding stonework in 2006, and comparison made with another pair of more intricately carved animal heads reset on the eastern archway of the west porch, and the Virgin panel which surmounts the west face of the same doorway (see Deerhurst St Mary 13, 14 and 5 respectively).¹

Only the northern chancel head (no. 18) retains a significant amount of its original paint layer (see colour *frontispiece*, Plate 1). Carved detail on the head is minimal, the surface being highly finished in preparation to receive definition through painted decoration. The treatment comprises a yellow 'background' field with detail — such as the insides of the ears, mouth and nostrils, and scrollwork on the cheeks — picked out in red. Black is used to accentuate the eyes. Further remains of similar polychromy can be observed on the hood-mouldings, voussoirs and columns of the adjoining chancel arch. Due to the

compromised condition of the paint layer it is difficult to deduce the original appearance of this scheme. The front face of the hood-moulding is bordered on both sides by a thick red band and the ground in between painted a pinkish colour which bears traces of red, possibly in imitation of marbling. The inside return of the hood-moulding was probably also originally painted in a single field of red. The decoration on the front face of the voussoirs seems to comprise three concentric bands, the inner and outmost being red, the middle band yellow. New research suggests that the outermost red band comprises a complex plant-scroll motif which runs around the voussoirs, with tendrils falling across the yellow field (see Bryant's reconstruction, Fig. 36).²

Close visual examination of the paint layers and scientific analysis of minute samples taken from these areas confirms the majority of the surviving polychromy to form part of a single phase of decoration.³ There is no reason to suspect that this paint layer is not broadly contemporary with the sculpture; indeed, the relative absence of dirt particles between the stone substrate and the lowest paint layer would suggest that only a short time elapsed between the completion of the carving and the execution of the painting.

1. Full details of this analysis can be found in Howe 2006a, copy of which has been deposited with the Society of Antiquaries of London; see also Gem *et al.* 2008.

2. For a full discussion of the plant-scroll motif see Gem *et al.* 2008, 136–9, where it is suggested that the scrollwork is of a form quite closely comparable to the scroll on the Deerhurst font (Deerhurst St Mary 3).

3. The heads were submitted to close visual inspection in diffuse, raking and ultraviolet illumination, and evidence of the painting materials, their application techniques and current condition documented. Minute paint samples were taken for analysis in order to characterise the range of painting materials used and ways in which they had been employed. All samples were examined under a binocular microscope (10x to 40x magnification) and their stratigraphy documented. A portion of each was then mounted as a

cross-section in clear polyester embedding resin and examined with a Leica DMRX optical microscope equipped with Leica 10x and 20 PL Fluotar™ objectives and a 50x PL Apo™ objective. For UV examination, excitation filter BP340–380 nm, dichroic mirror RKP 400 nm and suppression filter LP 425 nm were used. Photomicrographs were captured using a Nikon Coolpix™ 4500 camera. Many of the paint layers were also examined in dispersion in Meltmount™ ($n=1.662$), and their behaviour in incident, transmitted and ultraviolet light, and under crossed polars, recorded. Where further analysis proved necessary, microchemical tests were undertaken to identify characteristic metal ions and functional groups. The presence of organic binding media was examined initially using histochemical tests and confirmed using gas chromatography coupled with mass spectrometry (GC-MS).

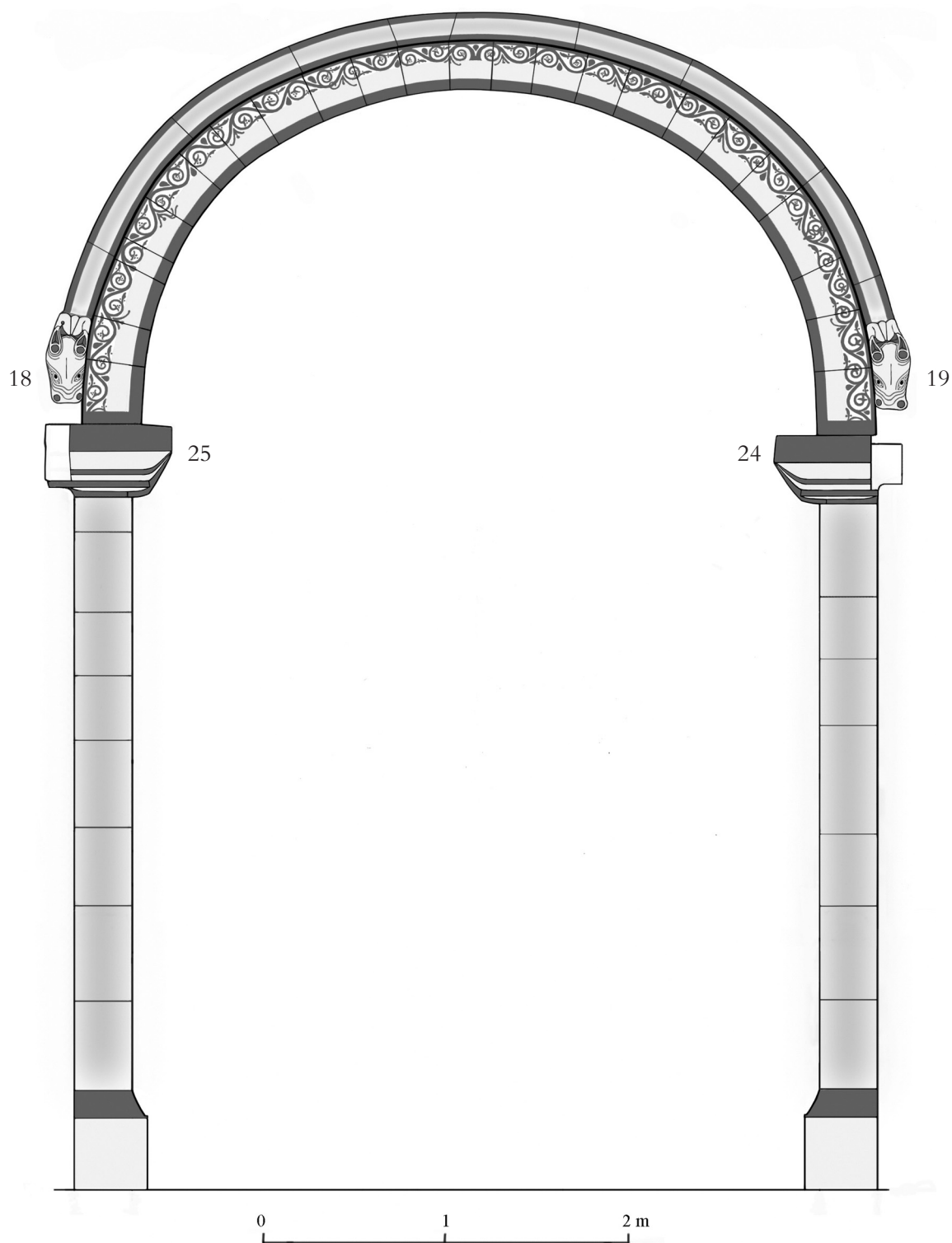


FIGURE 36

Reconstruction of the polychromy on the chancel arch at St Mary's, Deerhurst, showing the painted animal-head label stops (see also colour *frontispiece*, Plate 1) and the painted plant-scroll across the voussoirs of the arch. This reconstruction was reproduced in colour in Gem and Howe 2008. The numbers refer to the catalogue entries.

Preparatory techniques and ground layers

The chancel arch with its hood and animal heads is carved from oolitic limestone.⁴ Whereas the surfaces of the animal heads have been worked smooth in preparation for painting, the ashlar of the voussoirs and hood-moulding are more roughly tooled, and in many places chisel marks are visible. There is little evidence of preparatory techniques having been employed in setting out the chancel-arch scheme. This said, the use of ground layers on the chancel arch seems to have been quite discerning, relating broadly to the overlying paint scheme. In areas, for example, where a red paint layer was to be applied, no ground layer was employed to prime the substrate. Instead, the pigment was applied directly to the stone. By contrast, in those places — such as in the triangular recesses of the eyes — where a yellow paint layer was to be applied, a calcium carbonate layer measuring in the region of 100–300µm thick was first used to seal the stone, perhaps in order to achieve a brighter, more opaque colour.

Pigments and paint stratigraphy

Two phases of painting are evident in the samples taken from the chancel-arch scheme. The first, which appears to be contemporary with the animal heads, comprises a palette of red and yellow iron oxide, charcoal black and calcium carbonate white. Traces of a later — possibly medieval — paint layer, comprising only red and yellow iron oxide applied over a limewash layer, broadly correlate with the original Anglo-Saxon scheme.

Contrary to first appearances, the modelling of the animal heads does not appear to have been achieved in the most obvious manner, that is to say with the yellow background laid on and details subsequently highlighted in red. Indeed, it would seem that the modelling was achieved in the reverse manner. Details were first picked out in a red pigment comprising a mixture of finely ground and larger crystalline particles of iron oxide. A ‘wash’ of iron oxide yellow — sufficiently translucent to allow the red design to show through — was subsequently applied over all areas save the inside of the mouth. In the eye sockets, which were first picked out in red, the overlying yellow layer was extremely thick and combined with

carbon black. It seems, however, that the resulting colour proved insufficiently dramatic and a fine layer of pure black was subsequently applied over the top.

The same range of pigments deployed in a similar manner can be observed on the chancel-arch voussoirs and hood. A red layer comprising a mixture of both coarsely and finely ground iron oxide was applied directly to the unprepared stone as a continuous border of solid paint around the inner portion and as a narrow red band around the outer portion of the face of the voussoirs. Only the band of yellow which extends around the centre of the voussoirs appears to have been applied over a calcium carbonate white ground. Based on the limited samples taken, it is not entirely clear whether the iron oxide red plant-scroll motif — fragments of which are visible on the outer portion of the voussoirs between the band of yellow and the narrow outer red border — was also applied directly to the stone or over a ground of lime white and/or iron oxide yellow.

Binding media

Analysis reveals that an egg-based medium was used to bind the thick yellow paint layer of the original scheme.⁵ Histochemical tests also identified a proteinaceous medium in a grey mordant-type layer of which residues survive in the eye sockets of the north animal head (Deerhurst St Mary 18). This material, which fluoresces brightly under UV illumination, is not thought to be original, but rather a modern putty or plasticine used to adhere buttons which were inserted into the eye sockets in the 1950s or 60s.

Attachments

It has been suggested that the deeply drilled eye sockets of the north animal head may have been designed to hold inclusions of glass or semi-precious stones — a form of decorative embellishment for which there is growing evidence in this period.⁶ As attractive as this idea is, however, given the complex stratigraphy of paint in the sockets, it seems unlikely that the original intention had been to cover this painted decoration with some sort of insert.

The wider technological context

Comparison of the chancel-arch paint samples with

4. See Bagshaw *et al.* 2006, in particular 85–92 on ‘The Petrology and Structure of the East End’.

5. GC-MS analysis was undertaken by Dr Brian Singer of the University of Northumbria: see Singer 2007.

6. Cramp (Rodwell *et al.* 2008, 66–7), has drawn attention to a series of Anglo-Saxon stone carvings with deeply drilled — but now empty — eyes,

which survive at Breedon (Leicestershire), Castor, Fletton and Peterborough (Northamptonshire). On the ninth-century Crucifixion panel at Romsey (Hampshire), too, lead is recorded in the eye sockets of one of the angels, possibly as a setting for some other material or gemstone (Green and Green 1951, 35).

material taken from the animal heads and Virgin panel located at the west end of the nave (Deerhurst St Mary 13, 14 and 5) has revealed some striking technical similarities. Like the chancel-arch heads, they are carved from oolitic limestone and, in common with areas of the chancel-arch scheme, the substrate does not appear to have been primed with a ground prior to painting. In contrast with the highly finished surface of the chancel-arch heads and Virgin panel, the heads which adorn the moulding over the west porch's intermediate archway are far more highly carved, reflecting, perhaps, the fact that — in their original location — they were intended to be observed at closer range, the fine incised detail merely enhanced by the overlying paint scheme. What little remains of the polychromy on the west porch animal heads appears to comprise different grades of iron oxide red.⁷ Analysis reveals that, as in the chancel scheme, an egg-based binding medium was used to apply the pigment to the stone substrate.⁸ A sample taken from the hem of the Virgin's tunic reveals that, here too, a finely ground paint layer of iron oxide red was applied directly to the unprimed substrate, probably in an organic binding medium.⁹

The chancel-arch scheme is — in the Midlands and beyond — an exceptionally rare example of Anglo-Saxon sculpture retaining its original polychrome decoration and, as such, has been difficult to locate within a wider technological context. While previous studies of early medieval English painted sculpture have identified a range of pigments comparable with those employed at Deerhurst, little of this material is as early in date as the Deerhurst sculpture and none of it preserved *in situ*.¹⁰ A greater appreciation of the Deerhurst findings has been afforded by the recent discovery of the Lichfield Angel.¹¹ Thought to date from around AD 800, the finely carved limestone panel features the figure of an alighting Archangel (see Ill. 783). Excavated in 2003 from the Cathedral's nave, the panel — which comprises three separate fragments — is thought to have formed the corner of a shrine chest, possibly that of St Chad (d. 672), whose remains were reburied in a church on the site in the late seventh to early eighth centuries. Buried in dry rubble for over

a thousand years, the figure retains an unprecedented amount of its original painted decoration.

Analysis reveals that the oolitic limestone support is decorated with a palette close in range to that of the animal heads at Deerhurst, comprising iron oxide red and yellow, lead and calcium carbonate white, and carbon black.¹² Most significantly, given the relative dearth of information about binding media used in England at this time, the paint layer — like that of the Deerhurst sculpture — appears to have been bound with an egg-based medium.¹³ Like the Deerhurst north chancel head (no. 18), the Lichfield Angel also has carefully drilled eye sockets which may, though no physical evidence remains, have been intended to receive glass or gem-stone inclusions. But while the similarity of materials used at Deerhurst and Lichfield is striking, differences in the techniques employed in their application are undeniable. In contrast to the system employed at Deerhurst, where the use of ground layers seems to have been determined by the colour of the overlying paint layer, on the Lichfield Angel the paint layer is applied over a uniform ground layer of calcium carbonate white. And whereas the Deerhurst painter chooses to set out modelling detail in red *before* the application of an overall yellow wash, the modelling of the Angel's draperies is instead applied in a more conventional manner, executed in red on a yellow background layer.

If analysis of the animal heads at Deerhurst has revealed their painted decoration to have been executed in a relatively limited palette of readily available pigments, the materials and techniques employed have nevertheless been shown to be commensurate with those used on the most prestigious commissions of the period. It is of particular interest that the paint layer on both the chancel arch and west door heads appears to have been bound using an egg medium, a practice for which the Lichfield Angel is the only known domestic parallel in this period. Indeed, in its discriminating use of ground layers and unusual approach to modelling, the Deerhurst scheme distinguishes itself as the work of an accomplished craftsman, the analysis of which has contributed much towards our understanding of Anglo-Saxon painting practices.¹⁴

7. Instrumental analysis is required to confirm whether haematite was present, microchemical tests having proved inconclusive.

8. See Singer 2007.

9. While initial histochemical tests suggest that an organic binding medium was used to apply the paint layer, instrumental analysis to identify the binder has yet to be undertaken.

10. Pigments identified include haematite, iron oxide reds and yellows, carbon black and lime white, some of which were applied in an unidentified

oil-based medium. See proceedings of a conference held in the 1980s — Cather *et al.* 1990; also Park 1994, and Gem *et al.* 2008, in which this and additional Continental material is discussed.

11. See Rodwell *et al.* 2008.

12. For full details of the technical study see Howe 2006b.

13. GC-MS analysis was undertaken by Dr Brian Singer (University of Northumbria); see Howe 2006b, appendix 2.

14. See also Howe 2011.