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The Winchester Bible: Notable Features Observed During Conservation, 2012–15

Christopher Clarkson*

EDITORIAL COMMENT

Over the span of three years Christopher Clarkson worked on Volumes I and II of the Winchester Bible, dated around 1160. In the article below he notes techniques he had not encountered before and discusses parchment manuscripts overall. The text was the last to be written for publication by Chris before his death, aged 78, on 30 March 2017. He had substantially drafted and revised it, but illness prevented him from approving it in this form. Chris had also wished to illustrate the article with many of his photographs of the Bible. However, failing health made the selection of these images impossible. Chris's family have nevertheless decided to publish the article because they thought that conservators and friends might wish to read Chris's thoughts about his final conservation project. Dr Jedert Vodopivec, who had originally commissioned the article, kindly agreed to its publication here. Edited by Dana Josephson (in collaboration with Chris), with contributions by Professor Nicholas Pickwood.

REDAKTIONELLE ANMERKUNG

Über einen Zeitraum von drei Jahren arbeitete Christopher Clarkson an den Bänden I und II der Winchester-Bibel aus dem Jahr 1160. In dem folgenden Artikel stellt er Techniken fest, die er zuvor nicht angetroffen hatte und diskutiert Pergamentmanuskripte allgemein. Der Text war der letzte, der vor seinem Tod im Alter von 78 Jahren am 30. März 2017 von Chris zur Veröffentlichung verfasst wurde. Er hatte ihn grundlegend entworfen und überarbeitet, aber die Krankheit hinderte ihn daran, ihn in dieser Ausführung zu genehmigen. Chris hatte sich gewünscht, zahlreiche seiner Bilder der Bibel in seinem Entwurf des Artikels zu zeigen. Aus gesundheitlichen Gründen war die Auswahl dieser Bilder jedoch nicht möglich. Chris' Familie hat sich dennoch entschlossen, den Artikel zu veröffentlichen, weil sie dachten, dass Restauratoren und Freunde Chris' Gedanken über sein letztes Restaurierungsprojekt lesen möchten. Dr. Jedert Vodopivec, die den Artikel ursprünglich in Auftrag gegeben hatte, stimmte seiner Veröffentlichung hier freundlicherweise zu. Dana Josephson hat den Text in Zusammenarbeit mit Chris überarbeitet, mit Beiträgen von Professor Nicholas Pickwood.

KEYWORDS

Manuscript; parchment;
Winchester Bible;
conservation; humidification;
display dirt

SCHLÜSSELWÖRTER

Manuskript; Pergament;
Winchester Bibel;
Restaurierung; Befeuchtung

From 2012 to 2015 I worked on the Winchester Bible for the Dean and Chapter of Winchester Cathedral. In the course of conserving Volumes I and II of this large, four-volume manuscript I found a few fascinating techniques that I had not come across before. To avoid repeating phrases to describe these and other features of the Bible in the conservation report, I explained and defined at the beginning of the report the new terms I had coined and used. The following discussion is a summary of my descriptive terminology concerning the Bible and some facts about parchment manuscripts in general. I refer also to two earlier treatments carried out on the Bible: that by Charles Lewis, who rebound the original two volumes as three in 1820, and that by Miss Beatrice Forder, who rebound the Bible in four volumes in 1948.

Dating from around 1160, the Winchester Bible bridges the period of monastic scriptorium practice and the period when lay scribes and book producers had really taken over, which I usually say is *c.* 1300. The Bible was produced in the capital city of Wessex, the seat of government and royal power, so I am not

surprised that it exhibits some unique oddities and curiosities covering the whole field of scribal production, which elsewhere became established only some fifty years later. For example, as the city must have had more parchment-makers than any other nearby, obtaining the large amount of well-balanced calfskins needed for the Bible was surely easier here than in other scriptoria. Much of the preparation work could also have been executed by the parchment-maker rather than – as would usually have been the case in the mid-twelfth century – in the scriptorium.

Straightening parchment

Parchment is essentially a rawhide, in the sense that it is de-haired and de-fleshed mechanically.¹ Both materials are hygroscopic, and if kept dry they are both stable and durable; but if either becomes wet enough their fibril bundles will swell and begin to putrefy. Their durability and handling qualities can be enhanced by semi-tannage, fillers, whiteners, etc.

The main difference is in their production. Rawhide can be made soft and flexible by the addition of oil tannage, using fine oils from the animal's brain, spinal column, etc. Parchment is different; directly after de-hairing and de-fleshing, while still soaked in lime or enzymatic fluids, it is tightly and evenly stretched out on a herse (a wooden frame) and left to dry. The drying process exerts great tension as the membrane shrinks, causing the fibril bundles of the corium to become aligned in a compact, parallel formation. The result is a thin, firmly textured, semi-flexible sheet material.

Because parchment is a rawhide, when its fibril bundles become damp and are not kept under restraint, they swell and rearrange themselves, causing the sheet to distort and cockle. As long as the damp conditions have not caused the complete degradation of the collagen fibre structure, then the distorted area of parchment can, with careful and even humidification, plus a knowledge of correct handling, be straightened and made a flexible sheet once more. The degree of the success of the recovery depends on how far the collagen fibres have gelatinized or become liquid. If they have changed completely into a fluid (parchment size, for example) nothing can be recovered.

For at least the last two centuries many restorers have re-humidified parchment using the so-called 'damp-pack' process, where the dry, distorted area of parchment has been placed between a dampened sandwich of cloth or of pure cotton photo-blotter. This is the method Sandy Cockerell (1906–87) was using when I worked for him in the early 1960s.² I thought this a highly dangerous technique because the damp material was in direct contact with the water-based ink and paint layers. When I questioned Sandy about this, he replied that the period of contact must be brief, and he used a stopwatch to monitor the amount of time taken. But this is foolish, because in this situation the amount of moisture cannot be controlled; neither can the degree of sensitivity of the particular layer of paint. As we will see in this report, certain colours are more susceptible than others to even a slight degree of moisture change. It was at this period that I got interested in developing specialized humidification cabinets; I went to study the ones at the Public Record Office in Chancery Lane, London, and at the Conservation Department of the National Maritime Museum, Greenwich. It was interesting to observe that while these cabinets looked as though they had not been used for some time, an earlier generation had apparently found them necessary. One wonders if even Lewis used an early form of humidification cabinet, when he rebound the Bible in the 1820s.

I still do not understand Sandy's use of an inherently risky technique, especially when his father Douglas had adopted a far safer and more controlled method, in which moisture was kept well away from the parchment membrane. His invention of a double-frame

humidifying device was published in 1938 (Milne and Skeat 1938).³

Around the perimeter of a wooden frame are hung strings attached to bulldog clips at the upper end, and weights at the lower end. A dry cloth is stretched below the strings. The sheet of distorted parchment lies on the cloth while the clips are attached to the edges of the parchment. The weights lift the parchment sheet clear of the cloth. A damp cloth is draped over a second frame supported above the parchment, creating a simple humidity chamber around it. As the parchment takes up moisture from the surrounding humidified air, it gradually expands, and is tensioned by the weights. It is then left to dry over the next few days – a gentle, controlled method of drying. Sandy gave me a photograph of a more elaborate frame used by his father for straightening a crumpled leaf in a bound book. The open book could be supported in a cradle, but it worked on the same principle.

Spine folds

The calfskins selected for the Winchester Bible were cut and folded with the animal's spine running from fore-edge to fore-edge across the approximate centre of each bifolium. Each bifolium used one whole animal skin, so the rumps and necks are in the centres of the opposing fore-edges. The spine fold of the outer bifolium of each quire has usually suffered from the penetration of hide glue which has subsequently hardened. In many quires these folds have multiple breaks, in several cases resulting in the complete breakdown of the fold, creating two singletons. To repair such damaged spine folds in 1948, Miss Beatrice Forder stuck a sheepskin parchment guard inside the spine fold of the outer bifolium of each quire, except in quires 17, 20 and 27.⁴ She used strips of sheepskin parchment that were the same length as the spine folds. With few exceptions she used paste as the adhesive, and tended to apply the strips too wet. Shrinkage on drying caused the spine folds throughout the volume to assume a convex curve.

In order for me to be able to re-sew the text-block, and to allow the leaves to open, flex, and flow smoothly together, these folds would have to be straightened. If one were to rely on the primary sewing thread to pull the curved spine folds straight, excessive tension would have to be applied to the thread, creating horizontal undulations across the leaves, affecting how they could flex and flow. I therefore carried out the straightening in two stages. In the first I made temporary patch repairs under carefully controlled humidification, straightening the leaves with bulldog clips pinned to softboard. In the second I gently re-humidified each bifolium and placed it into a folded photo-blotter, leaving it under a light weight, and changing the blotters a number of times. The blotter folds straightened the parchment spine folds as they dried.

This technique worked, but treating each bifolium in this manner took some time.

New, full-length guards were not required for the other spine folds (further reducing the risk of distortion), except in the outer three bifolia of quire 17. The full-length guards I applied here were executed in carefully balanced environmental conditions throughout the process.

Patch repairs

There was a considerable number of parchment patches over what I described as ‘hole-breaks’ and ‘edge-bites’. As these had gelatinized edges, we know they were formed during the parchment manufacturing process. By comparing patches in the margins with those in the text area, and with the breaks that were avoided by the scribe, I could get a feel for which patches were executed in the scriptorium and which were possibly of a later date. Patches that extend to the edge of a leaf, where the edge of the patch is also gilded, were obviously done by Charles Lewis’s workshop in the 1820s or earlier. Some patch repairs are very nicely executed. Those which are made from calfskin and match well the texture and colour of the manuscript parchment were surely made from off-cuts of the original skin, by the original monks or perhaps the parchment-maker. I refer to these as ‘scriptorium patches’, and a common characteristic is that they usually have wide-scarfed edges.⁵ There are a few sheepskin patches, not so well done, where the scarfing is narrow, sometimes just a gesture; these I would suggest are nineteenth- or twentieth-century work.

Display dirt

This phenomenon was brought to my attention by Claire Donovan, when she discussed whether the Morgan Leaf was ever bound into the Bible⁶ (Donovan 1993: 33). One part of her evidence was the difference in discolouration between the present f. 87v and f. 88r. She explained that f. 87v was lighter-toned than f. 88r because it had been covered by the Morgan Leaf while this opening was kept on display. The argument that ‘over centuries of display as the grandest opening in the Bible, the dust gathered on the surfaces of the verso of the Morgan Leaf and f. 88[r]’ sounded convincing, but how could one explain even darker overall deposits on other openings?

Having not noted these deposits in codices or rolls in England before, I carried out a brief survey of Volumes I and II. This confirmed that all the openings where there were major illuminations were covered overall in an even layer of dust. It seemed to me that the dust must have been deposited over many years of undisturbed display of selected openings, leading me to describe it as ‘display dirt’. It makes one wonder how this great

Bible was actually used and displayed (for example, in the liturgy or in other ceremonial), and when a period of such use might have ended.⁷ For dust to cover both pages of an opening so evenly, the book must have been displayed at quite a low angle⁸ for long stretches of time⁹; then, as indicated by the display dirt, subsequently displayed at other openings.

This theory leads to several questions, for example: why have we not heard of such areas of display dirt in other great bibles? There probably are other examples, but none so dramatically dirty as the Winchester Bible.¹⁰ What were the particular conditions at Winchester that created such levels of dirt, compared with other similar monastic buildings?

I carried out discreet microscopic tests on particularly dark areas and found that in this bible there are two distinct types of display dirt. One type, possibly slightly more widespread, was best described as a coating of ‘oily dirt-grime’¹¹ – which is different to ‘handling grime’, as it is in a more even layer and not mainly confined to the fore-edge margin. Removal of this layer would have required the use of solvents. The other coating could be described as ‘dirt-dust’. Viewing it through a microscope and in raking light I could see that it lay more on the surface than the oily dirt-grime and could be shifted with a fine sable brush.¹² I felt that while such a layer could be lightened, traces of it could never be removed entirely. The coating of oily dirt-grime appeared to be stable and was more translucent than the other type.

Easel painting conservators I consulted tended to feel that they would regard both types of coating as ‘institutional dirt’, the removal of which would improve the images.¹³ To a conservator of manuscripts this decision is not so easy, because even if it were thought desirable, one does not have the protection of an underlying layer of varnish. I would therefore not consider using solvents but think only in terms of dry-cleaning, in this case using only very gentle methods such as soft hair brushes and soft erasers in a dabbing action, while keeping clear of text, rubrics and illuminations.

I chose to dry-clean a small area of f. 120v in this way; it was an example which showed extremely dark display dirt, where the first corrector’s faint ink might have been found under the murk. On a visit to the Oxford Colleges Conservation Consortium, where I was working, the Vice-Dean of Winchester, Roland Riem, studied my experiment. He thought that the result was a dramatic improvement and that the expert committee should also see it, and their opinion be obtained. Only one meeting with the expert committee had been organized, on 8 May 2014, and there was much to discuss. I explained to the committee that the display dirt was only on those openings with illuminations. In my short presentation I tried to consider the various possible concerns both of those looking at this

with an art historian's eye and of those interested in the history of the book. I pointed out that:

- Little could be done to shift the oily dirt-grime.
- Although dust retains higher-than-ambient moisture levels close to the surface of a material and thus favours mould growth, this does not appear to have happened, at least in Volumes I and II.¹⁴
- In my long career as a manuscript conservator I had never come across such dark display dirt affecting so many illuminated openings.
- A decision about cleaning had to be made now, because after binding, the type of micro-cleaning required would be awkward if not impossible, at least where the dirt was close to the spine.

I proposed to the committee that only the leaves with dry surface dirt be carefully lightened, not those with the oily grime; and I assured them that no abrasion of the underlying surface would take place. The committee thought the result of the cleaning trial was a great improvement and gave my proposal the go-ahead.

Book conservation and cleaning

I came into bookbinding in the early 1960s, and into book restoration in Florence after the devastating flood of November 1966. I was asked to teach in the Biblioteca Nazionale Centrale di Firenze and found that by the end of 1967 I had evolved a new subject, summed up by the new phrase 'book conservation'. I had an on-going argument with Roger Powell (1896–1990), who did not agree with attaching the term 'conservation' to our work. In those days it was only used in the fields of painting and fine art objects; subjects such as 'metal conservation', 'paper conservation', 'textile conservation' did not exist either. In the context of book 'restoration' everything, without question, was cleaned. Roger wanted me to teach good binding techniques, but my view was that I would not teach unless I could introduce aspects of conservation and preservation. I first tried to change the prevailing, damaging attitude towards cleaning by quoting the old saying of archaeologists, 'you may clean institutional dirt but not evidential dirt'. The problem is, of course, that it can be extremely difficult to tell the difference, even if you have a good level of historical awareness and considerable knowledge.

It was interesting to learn, therefore, that in 2012 a research project in textile conservation called 'Dirty Stories' was established that recognized the conundrum (Kiefer et al. 2013).¹⁵ 'Soilings and residues on historical objects are invaluable evidence of the object's maker or owner and its provenance, but can detract from the object's appearance if they obscure informative details or, worse, cause damage'. Dirty Stories was described as 'a novel collaboration between chemical scientists with

expertise in complex chemical mixtures analysis, conservation scientists with expertise in historical materials, textile conservators undertaking cleaning treatments and curators with historical knowledge about the textile being conserved. Dirt removed by mechanical cleaning and wet cleaning (aqueous and solvent) from historic textiles will be studied by applying a range of spectroscopic methods, for advanced chemical analysis' (Kiefer et al. 2013). Although textile conservation is a very different discipline to that of manuscript and much binding conservation, there are similarities in our approaches to what I am calling in this report 'display dust' and 'oily dirt'.¹⁶

Nora Meller, one of the first students in the Dirty Stories project, summarized the new approach in her M. Phil. Textile Conservation thesis:

The study of sooty soiling deposited on historic textiles due to environmental pollution is a new area of research for both textile conservators and conservation scientists. Although a number of studies are available examining soot damage to historic artefacts caused by accidental fire events, very little has been published about the effect of domestic and industrial fuel burning on textile collections. (Meller 2013, 2015)

Her thesis aims to develop analytical protocols for the investigation of dark soiling often seen on nineteenth- and early twentieth-century domestic textiles, suspected to have been caused by the polluted domestic and industrial environments of the period. Some of the analytical tools may be useful in giving us a better understanding of kinds of soiling and their impact on the deterioration of historic artefacts in the long term. A better understanding of all aspects is necessary to inform treatment decision-making when the removal of anything is in question.

The Morgan Leaf¹⁷

This single leaf has chapter headings from I Kings, and is decorated on recto and verso with 3-register miniatures showing 17 scenes from the lives of Samuel, Saul, and David. According to Walter Oakeshott, the underdrawings are by the Master of the Apocrypha Drawings, and it was painted by the Master of the Morgan Leaf.

The Morgan Leaf is said to have once been f. 87 of the Winchester Bible. However, the quire of which it would have been part has an f. 87 already and consists of four intact bifolia. Was the Morgan Leaf therefore a hooked singleton, or did it come from another quire?¹⁸ Scholars before Claire Donovan appear to have believed that this leaf was never inserted in the manuscript. However, Donovan argued that the leaf was laid over f. 87v, facing f. 88r, leading to marked differences in discolouration between these two leaves, caused by prolonged exposure on display (Donovan 1993: 33). The dust deposits on the Morgan Leaf

indicate that it could indeed have been in the Bible at a time when the Bible was on display, but for how long? And how can one account for the accumulation of far darker deposits of dirt, grime and other pollutants on most of the other double-page spreads that have illuminations? So many openings are affected that each one cannot have been displayed 'for centuries'; there must be another explanation. The established thinking (including Donovan's) is that the side of the Morgan Leaf with the text is the recto, and that the full-page miniature is on the verso, which would therefore have faced f. 88r. Several questions needed to be answered in order to shed light on whether the Morgan Leaf was ever bound in, before possibly being removed in the rebinding of 1820.¹⁹ Maria Fredericks, Book Conservator at the Morgan, was able to provide the following information (in italics) in answer to my queries:

Is what is presently referred to as recto or verso correct?

The recto and verso of the leaf are currently identified based on the proportions of the margins, with the presumed gutter margin very narrow in relation to the other three.

Is the binding edge identifiable?

The presumed spine-edge has a very narrow margin, and a 4mm horizontal slit at 4.1cm from the tail-edge, which was either cut as a tapered 'V', or is a slit that has opened up into a 'V' due to contraction of the skin. This may or may not be a sewing station; it's hard to say for sure, since it's the only one extant and there is no thread impression or any evidence of 'pull' at the station.²⁰

Which is the hair-side?

Hair follicles are clearly visible on the presumed recto side.

The edges of the four volumes are full-gilt; I would imagine that this was done in the early nineteenth century. Does the Morgan Leaf have full-gilt edges? If so, one long edge of the leaf, not gilded, would be the spine edge, enabling us to confirm its recto and verso.

There is no gilding visible on the edges of the leaf.

Does the Morgan Leaf have a hooked guard, or look as though it once had?

There is no hooked guard, or any remaining evidence of one; all edges appear to have been trimmed.

Of course, before the Morgan Leaf was framed (possibly for sale), the edges could have been trimmed, altering its dimensions; so I needed to know the exact height and width of the leaf. With the first volume of the Bible disbound, I could compare the leaf's dimensions with those of the text-block. Below I have added the dimensions of the Volume I text-block in brackets after Maria's measurements of the Morgan

Leaf (the other three volumes differ in their width by only 1–2mm):

57.6cm high at fore-edge [58.3cm]; 57.8cm high at spine-edge [58.2cm]; 38.5cm wide at head [40.4cm]; 38.8cm wide at tail [39.8cm].²¹

Even allowing for the large-format size and the dimensional change that would have occurred when the leaf was removed from its relatively damp historical environment into conditions that were likely to have been less humid, the difference in dimensions between the Morgan Leaf and the Bible text-block certainly makes it seem that the former has been trimmed heavily.²² Elsewhere Maria explained that the margins of both sides of the leaf have dark, crusty residues all around, bordered on the inside with a pencil-line – perhaps remains of adhesive from when the leaf was inlaid or perimeter-mounted in the 1940s.²³

Donovan says that the display grime should be found on the verso of the Morgan Leaf. However, the recto shows a greater accumulation of surface grime, on both the pigments and the blank margins. Maria said, 'Considering all that we don't know about the previous treatment of the leaf, and also the considerable difference in the paint surfaces on the two sides, it's difficult to say whether the verso was at one time equally dirty.'²⁴

Maria's last word harmonized with my thoughts. 'To answer your question about our Winchester Leaf – the bottom line is no, we haven't found any evidence to either confirm or refute the theory that it was at one point part of the Bible itself. Any binding evidence has been trimmed away, as have all of the original edges of the leaf, so there is really very little to go on, particularly when we can't look at the leaf and the codex side by side. Have you seen any evidence in the Bible itself?'²⁵ To which my answer also was, 'no'. As the quire is complete, I had already looked for traces of a neighbouring illuminated leaf – ghost off-sets of colour, the impression of a stub, etc. – but there were none.

Curtains

All the illuminated initials appear to have been covered with curtains at some time, as evidenced by groups of holes that have been pierced close to the initials. I am sure these curtains were added at a much later date; my assumption is based on the crudity and odd placement of the groups of sewing holes, quite a few of which actually penetrate the illuminated area. All the Romanesque manuscript curtains I have studied have been decorative and more neatly attached.

Puzzling paste deposits

An interesting mystery in Volume II concerns the deposits of paste that range in width from c. 11 mm to 30 mm, covering much of the spine margin of ff.

131r, 132r and 135r. They surely must be related to the division of the original two volumes into three in 1820, but I cannot quite suggest how, as the positions and the widths of the deposits do not make sense to me at present. These deposits were so thick and heavy that they stiffened each leaf, reducing its flexing. Slight shrinkage of the leaves has also caused horizontal undulations, which also affects the flexing. To improve the handling I thinned the deposits slightly, without losing the evidence of skinning which showed that another sheet – perhaps tissue – had once been attached and subsequently removed.

Adhering fibres

The leaves of the Bible have clearly suffered in the past from ‘damp-pack’ treatment. The evidence for this consists of deposits of cotton fibres on the leaves, which were analysed and compared by Dr David Howell with a sample of photo-blotter (c. 1940–60) from Roger Powell’s collection.²⁶ Dr Howell agreed that the fibres on the Bible matched the pure cotton fibre from the sample. On some areas of the manuscript, cotton fibres are stuck firmly to specific coloured paints. Parts of the text are also affected, but largely it is the illuminations. The paint colours chiefly affected are brown, bronze, yellow, green, and white. Where white is mixed with another colour the white also suffers from flaking and friable areas. Often the brown hair and beards are turning white from the deposits of so much cotton fibre.

Microscopic examination also reveals the distribution of white cotton fibre not just on illuminations but overall, from earlier humidification and straightening by damp-pack and pressing treatments, probably carried out by Miss Forder. It is extremely sad that I could not consult her extensive treatment notes, said to have been in the Cathedral Archives but seemingly lost in the last few years.

Relieving cuts

Contemporary ‘V’ cuts made in the edge of the skin to lessen distortions caused by cockling are a feature of the Bible; I refer to these as ‘relieving cuts’. As the neck and rump are at the centre of the fore-edges, this is also where the pleats caused by the neck, rump and pelvis distortions are found. In preparing the skins for writing, scriptorium practice was to make a ‘V’ cut in one or more of the sharper pleats, to scarf both cut edges, and to draw them together and join them using parchment glue, making the joins of even thickness and the whole area flatter. Some of these relieving cuts are so beautifully executed that transmitted light is required to show up the overlapping scarfing.

Scarfs made by the scriptorium have characteristically wide edges; the same applies to original patched holes. For many years I believed that the monks achieved this generous width of scarfing by simply patching the hole and then rubbing both sides of the leaf with abrasive until the edges of both patch and hole were scarfed and feathered together, before further surfacing, pricking, and ruling. I have experimented with this idea several times using various abrasives, with some success. However, I have always taught conservators to scarf by using different-shaped sanding sticks and pegs, attempting to obtain the widest scarf width. The wider the scarfed edges, the less intrusive and more flexible the repair that can be made, allowing the leaf to roll and flow nicely across the area of repair.

As a consequence of the Bible’s folio size there are many relieving cuts at the centres of fore-edges. In a few cases the adhesive has broken down, allowing one to study the lovely, wide-edge scarfing. Folio 199 has one such ‘V’ cut running across the width of the fore-edge margin, relieving tension in the rump region of the calfskin; edges of the cut have been scarfed on both sides. Unfortunately this example was too heavily pressed, and possibly re-glued, at a later period. Under the microscope the abrasion of the edges is very fine indeed; one edge appears to be scarfed on the hair-side and the other on the flesh-side. Surely the scarfing must have been done with a form of shaped abrasive stick? Even so, how did they obtain the width, and how did they manage to scarf the point of the ‘V’? A few other relieving cuts, in particularly good condition or where adhesive has failed and worth study are on ff. 61 and 62, f. 69, and f. 149.²⁷

Notes

1. Following Dr Ronald Reed’s preference, I have used ‘parchment’ as the generic term throughout this report. Over the years the word ‘vellum’ has been used in several different ways, for example to describe a fine calfskin, or simply to refer to a finely textured or finished skin from whatever animal.
2. Sydney Morris Cockerell, known to associates as Sandy.
3. Calling it a ‘stretching-frame’ was unfortunate, as this does not fully describe the action taking place.
4. Interestingly, not the accepted technique of the nineteenth-century binding trade, which was to guard the outside of the fold, thus retaining an even fore-edge.
5. See below, ‘Cuts to relieve distorting tension’.
6. See also below, ‘The Morgan Leaf’.
7. As it was unfinished, however, it may never have been used in such a manner.
8. Because the display dirt is distributed so evenly across the whole double-page surface.
9. It is difficult to guess the length of time, as the amount deposited is also dependent on how dirty the environment was.

10. I understand the worst of the surface dirt in the Bury Bible (Cambridge, Corpus Christi College, MS 2) is also associated with some impressive openings.
11. One imagines oil heaters in very dusty conditions may cause this; or the manuscript being open in the greasy context of the refectory could be considered, but reading in such conditions would not leave an even dust layer.
12. Even more easily when the deposit was on the flesh side of the skin.
13. It could also be argued that so long as both 'before' and 'after' states are well recorded (including photographs in all cases), a decision to clean seems entirely justified in order to present the work of art to viewers in the best possible condition.
14. This is the reason for all the cleaning programmes in libraries.
15. In the University of Glasgow's School of Culture and Creative Arts, as a cooperation between Dr Anita Quye, lecturer in conservation science at the University of Glasgow, and Dr Johannes Kiefer, senior lecturer in chemical engineering at the University of Aberdeen.
16. Perhaps 'display soiling' is a more meaningful phrase.
17. New York, Pierpont Morgan Library, M.619 (known in the Morgan Library as 'The Winchester Leaf').
18. [Ed.: Clarkson did not suggest how, given the subject-matter of the Morgan Leaf, it could have found a place in another quire.]
19. [Ed.: As the 1820 foliation, which is still current, does not include the leaf.]
20. A paper hinge had covered this slit; it was revealed when remounting the Morgan Leaf for loan to an exhibition at the Metropolitan Museum. Maria was correct in thinking of a sewing layout with knife-cuts, a typical Romanesque binding technique. However, Volume I has no knife-cuts, but holes formed by a bodkin-like tool.
21. E-mail, 31 July 2014.
22. The Morgan Leaf has been kept in the museum at 50 ±5% relative humidity for many years. Its storage conditions between its presumed removal from the Bible (possibly c. 1820, but the precise date is not known) and its acquisition by Pierpont Morgan in 1912 from the dealer Leo S. Olschki are not known, and dimensional changes could have occurred at almost any time.
23. E-mail, 31 July 2014.
24. E-mail, 31 July 2014.
25. E-mail, 7 January 2015.
26. Dr Howell retired as the Bodleian Libraries' Head of Heritage Science in December 2019.
27. [Ed.: All folio references in this paragraph are believed to be in Volume I.]

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