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Plate 1 Hans Holbein the Younger, *A Lady with a Squirrel and a Starling* (NG 6540), c. 1526–8. Oak, 56 × 38.8 cm. After cleaning and restoration.

Hans Holbein's *A Lady with a Squirrel and a Starling*

SUSAN FOISTER, MARTIN WYLD AND ASHOK ROY

Introduction

Hans Holbein's *A Lady with a Squirrel and a Starling* (NG 6540) was acquired by the National Gallery in 1992, its first example of the characteristic half-length portrait Holbein painted of his English sitters (Plate 1). The blue-green background adorned with vine leaves occurs in a number of other portraits, as well as in some religious works, but the presence of the pet squirrel on a chain and the starling is particularly unusual.

The portrait had descended in the collection of the Marquesses, and previously the Earls, of Cholmondeley. Originally from a Dutch collection, it was bought by the Earl of Cholmondeley in 1761.¹ The Dutch provenance may not have any bearing on the nationality of the sitter, as other Holbein portraits with identifiably English sitters were to be found in the Low Countries in this period.

The sitter in NG 6540 has never been identified, but the portrait has usually been dated to the years 1526–8, the period of Holbein's first brief visit to England. The sitter wears a fur cap very similar to one worn by a member of the family of Sir Thomas More, Margaret Giggs, who was also portrayed during this period in a lost group portrait, although they are clearly not the same woman (Fig. 1).

Holbein's usual procedure for making painted portraits appears to have depended on first making a preparatory drawing directly from the sitter. There is documentary evidence of his sitting with Christina of Denmark, which lasted three hours.² The resulting portrait, now in the National Gallery, is on such a large panel that it is likely that Holbein made a drawing or indeed several sketches in her presence, which he used to work up the painted portrait. Many such drawings survive, and in some cases the corresponding painted portrait also exists. It has been established in cases where both drawing and painting survive that the similarity of size is such that the outlines of the drawing must have been transferred to the painted panel.³ The study of infra-red photographs and reflectograms of the underdrawing revealed in the paintings has supported this view, showing in several instances brush outlines of a somewhat mechanical nature. To effect this transference, Holbein probably covered the back of a piece of paper with

black chalk and sandwiched this between his drawing and his prepared panel. A very light pressure would then have been sufficient to transfer the outlines to the panel, where they would have been reinforced, for example with the brush.⁴ In a number of works, however, no outlining of the facial contours is visible with infra-red reflectography, presumably because the painted contours follow the traced outline so precisely. In other instances the contours and some details of the features have been significantly adjusted.⁵

Few of Holbein's surviving preparatory drawings show much more than the head and shoulders of the sitters. The inclusion of hands is rare, and of background details even more so. Such details may have been the subject of separate drawings, combined to create the finished portrait, but very few drawings survive to provide any indication of this.⁶ No preparatory drawings survive in the case of *A Lady with a Squirrel and a Starling*, but the results of cleaning and of a detailed technical examination, described below, give some indications of the working procedures Holbein employed on this occasion and of significant changes which were made to the composition.

The treatment of the picture

Before its acquisition by the National Gallery, Holbein's *A Lady with a Squirrel and a Starling* was, as is customary, examined in the Conservation Department. The picture was clearly in very good condition, though its appearance was slightly marred by old retouchings and varnish. Its single member oak panel had been planed down and cradled, but was sound. A prominent old retouching, much darker than the blue background, ran down the right outline of the ermine cap, apparently disguising a pentimento. The sitter's hairline was also retouched. The delicate modelling of the squirrel and the detail of some of the sitter's costume were obscured by a thick yellowish varnish and old restoration over minor paint losses. The squirrel, the velvet edging and turned-back cuffs of the black bodice, and some of the folds, were difficult to read.

Following its acquisition a more detailed technical examination was made by X-radiographs, infra-red photography and infra-red reflectography. The



Fig. 1 Hans Holbein the Younger, *Margaret Giggs*, c. 1526–8. Black and coloured chalks on paper, 37.9 × 26.9 cm. Royal Library, Windsor Castle.



Fig. 2 Hans Holbein the Younger, *A Lady with a Squirrel and a Starling*. Detail of the sitter's head, before cleaning.

combination of the varnish discoloration, the incongruously dark and roughly textured retouchings along the change of outline in the ermine cap, the imprecise retouchings over various minor scratches and the clumsily repaired wearing in the shadowed side of the sitter's face led to a decision to clean the picture after it had been on display for a few months.

The picture had last been cleaned in the 1920s, when some work, unnecessary but fashionable at the time, was done to the panel. This consisted of planing the panel down to around 8 mm in thickness, removing the unpainted wooden borders, trimming the sides so that the panel was precisely rectangular and chamfering away the edges at the back. The cradle then fixed to the panel laps over the chamfered back edges and incorporates a new unpainted border about 1 cm wide. The oak panel has not warped since this treatment and the cross-bars of the cradle move freely. The only uncertainty was the question of whether any paint had been removed with the unpainted borders. This could not be conclusively settled, but close examination revealed small sections of what seemed to be the ridge at the original painted edge. It is likely that the original paint surface did not have entirely straight edges, and that slight irregularities were shaved away.

The removal of the old varnish and retouchings revealed Holbein's precise and subtle painting of the greys and blacks of the costume and of the whites of the cap, bodice and shawl. The technical photographs had revealed many pentimenti, which are discussed below. Cleaning established conclusively that Holbein himself had altered the outline of the ermine cap, reducing by half the amount of ermine visible beyond the sitter's cheek by covering the edge of the cap with the blue paint of the background. This alteration had darkened, as had the two layers of retouching put on to hide it. Comparison of before and after treatment photographs (Fig. 2 and Plate 1) shows the change in the hairline, which was first painted with a higher peak and with the hair coming lower on the temple, nearer to the corner of the eye. Holbein then repainted the forehead over the hair on the temple, and lowered the hairline in the centre of the forehead. An earlier restorer had added hair over the temple, in effect imitating Holbein's original design. After cleaning, the losses and scratches in the paint surface were retouched, the pentimento of the ermine cap reduced and the picture revarnished.

Technical description of the picture

Ground, priming and drawing

The ground on the oak panel consists only of a layer of natural chalk in glue medium,⁷ coated with a thin layer of what appears to be a drying oil.⁸ This sealant

layer is just visible in cross-sections (see Plates 2 and 3) and occasionally incorporates a few very fine black particles of the underdrawing,⁹ for example in sections from the vine leaves and the edge of the sitter's shawl. There is no distinct pigment-containing *imprimatura* applied over the chalk ground, unlike that found in certain Holbein panel paintings (see below) and other contemporary works which follow a German tradition of technique.¹⁰

The background

The blue-green background to Holbein's portrait is particularly well-preserved; its striking colour quality and unmodelled field are probably little changed from the time the picture was painted. The technique for plain-coloured background designs in Holbein's portraits and those of his followers, particularly where blues and greens are used, varies considerably. Examples of the use of each of the traditional blue pigments available in the sixteenth century – that is, ultramarine, azurite, smalt and indigo – are known for Holbein school portraits and result in varying degrees of colour change and condition.¹¹ In the present painting, Holbein makes use of natural (mineral) azurite, mixed with lead white, in two identical layers over the primed chalk ground (see below and Plate 2). The azurite is coarsely ground and strongly coloured, inclining slightly towards a green tone, and contains some particles of rust-coloured cuprite often found in the mineral pigment (Plate 2).¹² The high proportion of lead white in the paint layers protects the blue copper-containing pigment from chemical change and therefore from colour change. Unlike smalt and indigo, azurite is known not to be vulnerable to photodegradation. The medium for the blue-green paint layers has been shown to involve the straightforward use of linseed oil as the binder;¹³ the copper and lead-containing pigments present would each have increased the drying qualities of the medium, also accounting for its good condition. Similarly well-preserved plain blue backgrounds involving natural azurite and lead white in oil are often seen in German sixteenth-century portraits on panel, two examples of which, both male portraits, are in the National Gallery's Collection: one by Baldung (NG 245), the other by an unknown south German painter (NG 1232).¹⁴

Comparison may be made with the turquoise background colour of Holbein's large full-length painting of *Christina of Denmark, Duchess of Milan* of the late 1530s (NG 2475), which is in a less good state than that in the *Lady with a Squirrel and a Starling*. *Christina of Denmark* was studied during its cleaning in 1967; the status of the dark blue background had already been investigated in cross-section in 1950 and found then to have been subjected to at

least two comprehensive repaintings.¹⁵ Holbein's original blue background was uncovered in 1967. It is distinguished from that of the present small portrait by a strip of shadow at the right side of the composition, as well as by the representation of a distinct shadow cast by the standing figure of Christina. The background colour of *Christina of Denmark* is also executed in natural azurite, but it differs from NG 6540 in having been painted over a mid-grey priming of oil paint as a single layer of coarsely ground azurite, containing in some areas almost no lead white pigment. In contrast to the background of the *Lady with a Squirrel and a Starling*, that of *Christina of Denmark* had probably darkened. The granular texture of the paint film would have required a rich oil content in its preparation and the coarseness would have allowed varnish to penetrate.

As in the background colours of Holbein's portraits, the *imprimatura* laid over the chalk ground, where one is present, varies considerably. A fairly dark grey *imprimatura*, for example, has been recently detected beneath the double portrait of Jean de Dinteville and Georges de Selve ('*The Ambassadors*'; NG 1314) of 1533. The National Portrait Gallery's version of the *Portrait of Thomas Cromwell*, a panel after Holbein, has a very light grey priming over a chalk ground, although there the dark blue pigment of the brocaded wall covering is natural indigo rather than azurite. Similarly, the *Portrait of Sir William Butts*, by a contemporary or near-contemporary follower of Holbein, also in the National Portrait Gallery, is painted on a very light-toned grey priming over a chalk ground. In this picture, too, the background is worked in indigo mixed with white, now severely faded to a light greyish green.¹⁶ It seems likely that painters emulating Holbein's work replaced relatively costly azurite – a standard pigment in Northern European painting in general and German painting in particular – with the cheaper and less stable dark blue dyestuff, indigo.

For court paintings, intense blue backdrops based on lapis lazuli ultramarine, always the most expensive of the available blue pigments, were sometimes employed. The small portrait by Holbein of Henry VIII in the Thyssen-Bornemisza Collection provides a good example. Portrait miniatures in gum medium, including many by Holbein, were often painted with genuine ultramarine backgrounds, their small scale limiting the quantities of ultramarine required.

The tendrils of the vine which decorate the background of *A Lady with a Squirrel and a Starling* are painted directly on to the azurite background in a technique that is very likely repeated by Holbein in the various portrait backgrounds in which this design, and similar designs, occur. The method of painting appears to be a conventional one for representing

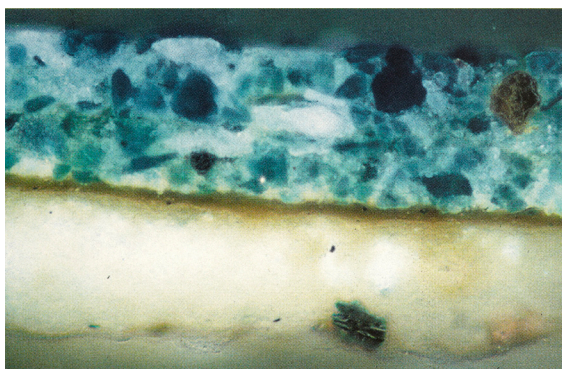


Plate 2 Cross-section from blue-green background, lower left-hand edge, showing two layers of natural azurite combined with white. The chalk ground is coated with a thin *imprimatura* of unpigmented oil. Photographed under the microscope in reflected light at 400× magnification; actual magnification on the printed page 315×.

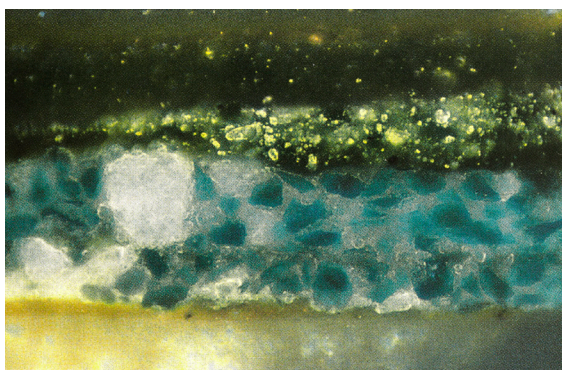


Plate 3 Deep green of vine leaf, right-hand edge, painted directly over the background (see Plate 2). The layers for the foliage consist of a solid yellow-green composed of verdigris and lead-tin yellow, glazed with 'copper resinate'. Cross-section photographed under the microscope in reflected light at 400× magnification; actual magnification on the printed page 370×.

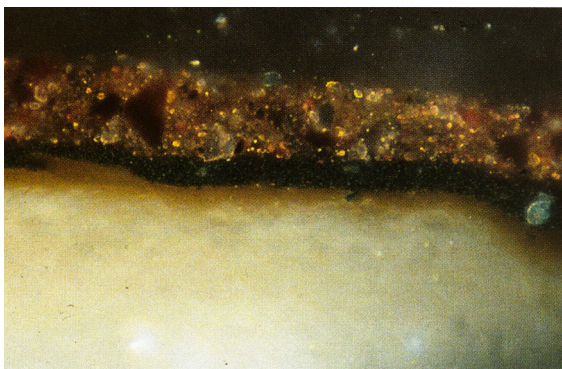


Plate 4 Translucent brownish shadow of the sitter's thumb with a pentimento of her black dress beneath. The flesh paint contains: Cologne earth, red lake, red ochre, vermilion and some black. Cross-section photographed in reflected light under the microscope at 750× magnification; actual magnification on the printed page 710×.

foliage in German panel painting of the sixteenth century. For the stems and leaves of the vine in the present portrait, the most saturated greens contain 'copper resinate',¹⁷ with charcoal black added to the darkest tones. Undissolved verdigris is detectable under the microscope in the glaze (Plate 3),¹⁸ which was found to have been bound in linseed oil.¹⁹ The denser yellow-green highlights are mixtures of lead-tin yellow (identified as 'type I'²⁰) combined with verdigris, also in linseed oil but probably containing a little added pine resin. Final thin glazes of undiscoloured 'copper resinate' modify the opaque highlights on the edges of the leaves. The method of painting is closely similar in pigments and layer structure to that found in the extensive passages of foliage of Altdorfer's large panel *Christ taking Leave of his Mother* (NG 6463) of 1523.²¹

The figure of the sitter

The dark dress and the woman's creamy shawl are simply painted. The most saturated black paint is composed of very fine dark brownish-black pigment, microscopically of the character of lampblack (the soot collected by condensing a smoky flame), containing a trace of lead white pigment, and is painted as a single layer. A small proportion of copper was detected in a sample by EDX analysis, probably originating from an added drier. Where the colour becomes greyer and warmer, for example in the woman's bodice, more lead white is added to the lampblack and also some red earth. Interestingly, Holbein makes use of the same finely divided black pigment for Christina of Denmark's coat in NG 2475 and in the grey priming layers for *'The Ambassadors'*. In the latter picture, lampblack with red earth make up Georges de Selve's dark chestnut-coloured gown. In the present small portrait, the warm shadows of the shawl at the sitter's right shoulder contain some translucent brown pigment, identified under the microscope as Cologne or Cassel earth, mixed with white in varying proportions. This organic brown is used also in the shadows of the flesh, for example in the woman's hand (Plate 4), where there are also present a brownish-red lake, red ochre and traces of vermilion and black. The paler flesh tones contain lead white very sparsely tinted with vermilion, Cologne earth and a little cool blue-black.

Interpretation of the X-radiograph and infra-red reflectogram

Two minor changes in the design of *A Lady with a Squirrel and a Starling*, to the outline of the ermine cap and to the hairline, are described above. Before cleaning, both were emphasised by the retouchings designed to hide them. The infra-red reflectogram also reveals that the sitter's left shoulder was originally slightly lower (Fig. 4).

However, more significant alterations were made lower down the picture and could only be detected in the X-radiograph (Fig. 3) and the infra-red reflectogram. The right arm was first painted 3 cm lower than its final position, and was slightly below the level of the sitter's waist. There was originally a belt or girdle, now covered by the raised arm. The belt appears to consist of a thin strip of light-coloured fabric attached to a round or oval ring. The X-radiograph clearly shows the ring and the left-hand part of the fabric of the belt sloping up towards the corner of the white wrap. The fabric is gathered by the ring, and is wider to the left. The right-hand part of the fabric is less clear on the X-radiograph and slopes upwards less steeply. It is possible to interpret this part of the X-radiograph as an open book, but a belt seems very much more likely. Starting just below the ring of the belt and curving down to the left is the line which denotes the edge of the turned-back velvet cuff. The black fabric of the sleeve above and to the left of this curved line is denser (lighter) in the X-radiograph because the paint contains a small amount of lead white. This line is much clearer than the equivalent line in the raised (final) sleeve, which is parallel to it and which runs across the fabric of the belt to the left of the ring. The position of the earlier line can also be detected by a slight ridge of paint under the present sleeve. A second change, the evidence for which is less easy to interpret, concerns the squirrel. The squirrel is perched with its hind legs on the sitter's wrist; its weight has pressed down the black velvet cuff. The black velvet edging strip which runs down the centre of the black dress is visible between the squirrel's back and the top of its tail (Fig. 5). The infra-red reflectogram (Fig. 4) shows that the area reserved for the edging strip continues under the tail to meet the identical strip at the top of the dress and that it runs down under the squirrel's body to the sitter's waist. The upper and lower parts of the velvet edging strip, that is the parts now covered by the squirrel's tail and body, appear lighter in the reflectogram. This is probably because the light-coloured ground reserved for the strip was not painted before the squirrel was added. The black fabric of the dress on either side of the central edging strip seems to extend under the squirrel's body but not its tail, where there is another reserved area.

It seems likely that the squirrel was not part of the original design. The sleeve in its lower position, and the belt and some of the dress above, were painted first, with one layer of white paint laid in for the wrap. The sleeve was then moved upwards, perhaps for the squirrel to be added at an appropriate height. The X-radiograph shows clearly that an area has been reserved for the squirrel's tail to cross the wrap. The second layer of white paint establishes the

reserve: the small area of white to the left and the large area to the right leave a gap for the tail (Figs. 3 and 4). This suggests that the squirrel was introduced only after the earlier version of the dress with a belt and a lower sleeve were painted and the shawl laid in.

The bottom right corner of the picture has also undergone changes; interpretation of the X-radiograph and reflectogram is difficult. The light triangular area in the extreme bottom right is most easily read as the sitter's clenched left hand in an earlier position, but it might also be part of the first, lower, version of the right hand.

The evolution of the composition

Most of Holbein's surviving portraits from his period of working in Basel and also from his first visit to England in 1526–8, as well as many from his second visit of 1532–43, are half-lengths. In a number of these compositions the sitter is shown in three-quarter face looking to the right, with the right arm roughly parallel with the lower edge of the picture and the right hand in the lower right-hand corner of the panel.²² In those instances in particular where there is little background detail the figure is usually quite tightly confined, leaving only a small space above the head by the edges of the picture. In this *A Lady with a Squirrel and a Starling* is characteristic of Holbein's portraits. Several of the portraits also include a similar background of vine leaves (Figs. 6–9) and it is notable that the treatment of the edges of the compositions in all these portraits appears similar.²³ As in *A Lady with a Squirrel and a Starling* the leaves tend to stop just short of the edges of the panel. In two instances, the portraits of William Reskimer and Derich Born (Figs. 6 and 7), the edges of the panels are certainly uncut, and this, as well as other compositional similarities, tends to support the contention made above that nothing material has been lost from the edges of the National Gallery panel, despite the fact that the tail of the starling is abbreviated. Moreover, in addition to this characteristic positioning of the vine leaves, the proportions of the panel are extremely similar to those of similar-sized panels which retain their original edges.²⁴

The tightly circumscribed positioning of the hands in the lower right-hand corner of *A Lady with a Squirrel and a Starling* therefore appears to be intentional, and, as noted above, can be paralleled in other Holbein portraits. Though the X-radiograph shows an alteration here (Fig. 3), the hands would still have been placed in the corner of the composition. However, there is no precise analogy for the arrangement of the hands one on top of the other. Indeed, in no two surviving Holbein portraits are there hands which are identically posed, although the hands themselves in Holbein's portraits tend not to be

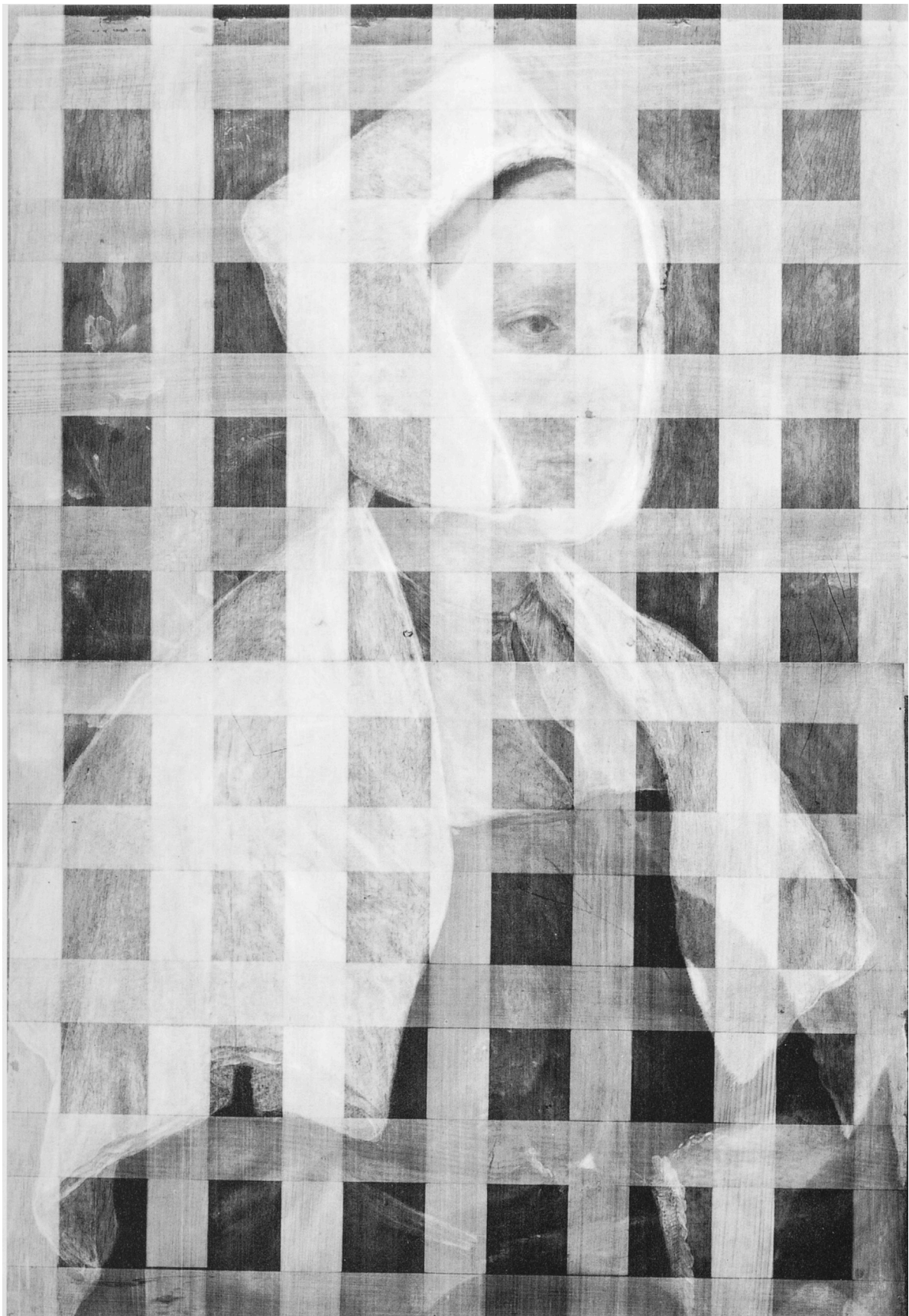


Fig. 3 Hans Holbein the Younger, *A Lady with a Squirrel and a Starling*. Composite X-ray photograph.



Fig. 4 Hans Holbein the Younger, *A Lady with a Squirrel and a Starling*. Computer-enhanced composite infra-red reflectogram (recorded and assembled by Rachel Billinge).



Fig. 5 Hans Holbein the Younger, *A Lady with a Squirrel and a Starling*. Detail of the squirrel and the sitter's bodice.



Plate 5 Hans Holbein the Younger, *The Meyer Madonna*, c. 1526–8. Panel, 146.5 × 102 cm. Darmstadt, Schloss Museum.



Fig. 6 Hans Holbein the Younger, *William Reskimer*, c. 1533. Panel, 46.4 × 33.7 cm. Royal Collection.



Fig. 7 Hans Holbein the Younger, *Derich Born*, 1533. Panel, 60.3 × 45.1 cm. Royal Collection.

strongly differentiated. There is only one surviving study from life for the hands of a portrait,²⁵ and it may not have been Holbein's practice to make them: he may rather have assembled them from a standard repertoire of hands. Thus the sitter in *A Lady with a Squirrel and a Starling* might not have posed for the representation of her hands. In fact the improbably cupped right hand in the portrait of Reskimer (Fig. 6) could almost have been rotated to provide the left hand of *A Lady with a Squirrel and a Starling*; her hands are not noticeably feminine.

As noted above, the alteration of the pose of the hands appears to have been part of a larger modification to the portrait. Brushstrokes visible in the X-radiograph seem to indicate the presence of a belt or girdle similar to those found in the More family group portrait and other portraits of women.²⁶ In the *Meyer Madonna* in Darmstadt (Plate 5) a similar girdle worn by the Virgin is clearly visible, but her arm is raised well clear of her waist to expose it. In *A Lady with a Squirrel and a Starling* the position of the arm was originally just below this girdle. It was perhaps raised, covering the girdle, in order to provide a perch for the pet squirrel, after it had been decided to introduce it.

Birds and animals such as falcons and monkeys are found in several Holbein portraits, although if a specific reason is required for the presence of the starling here it remains to be discovered.²⁷ The depictions of both squirrel and starling probably came from a drawing such as those Holbein is known to have made of other animals.²⁸ There is no underdrawing visible in the depiction of either of these animals in the infra-red reflectogram, but as with the leaves, such drawing would be difficult to discern against the background or against the sitter's dress.

The infra-red reflectogram (Fig. 4) does, however, reveal some areas of drawing in the figure of the sitter, evidently executed freehand with the brush. A line bisects the top of the cap, possibly showing a depression which was not followed through in painting. In the shawl there are a number of lines which stand for folds. Around the neck are strokes indicating that here the fabric was tightly bunched, while around the shoulders are further strokes to show the placing of the undulations of the material over the sitter's body. These lines have a slightly hesitant character, and include a broken line radiating from the neck, which has parallels with some of Holbein's preparatory drawings for other portraits.²⁹ Not all of them, however, were followed exactly in the painted surface. The shawl appears to follow the sitter's body more smoothly in the painting, and a fold on the left hand-side no longer falls vertically, but radiates at an oblique angle to the folds at the edge of the shawl. Here, although a triple contour is apparently care-



Fig. 8 Hans Holbein the Younger, *Sir Henry Guildford*, 1527. Panel, 82.6 × 66.4 cm. Royal Collection.



Fig. 9 Hans Holbein the Younger, *Lady Guildford*, 1527. Panel, 87 × 70.5 cm. Saint Louis City Art Museum.

fully drawn, the surface contours differ, particularly in the increased proximity of the two lower folds, creating a more effective impression of depth in the edges of the fabric.

There is little evidence of drawing in the facial contours. This is consistent with other Holbein portraits and an indication that a drawing has been transferred to the panel and its outlines followed closely. As has been seen, however, the contour of the right-hand side of the cap was modified during painting, as was the outline of the hair. In the case of other Holbein portraits it is known that similar modifications were made to the side contours of the face, but this was sometimes carried out at the underdrawing stage.³⁰ It is possible that such modifications were made following further sittings with the subject, but more likely that they were the result of the process of combining a head taken from a drawing from the life with other elements in the composition, which may have been taken from similar studies, of animals and foliage for instance, and with compositional sketches; some of these sketches and studies would have been fresh, but some were apparently re-used. The process of assembly would lead almost inevitably to revisions in the composition.

The date of the portrait

The re-use of compositional elements and poses is characteristic of Holbein's working methods. Such re-use often spanned a period of some years, as witness the reappearance of a cord in the background of the portrait of Sir Thomas More of 1527 (New York, Frick Collection) in the portrait of Derick Berck of 1536 (New York, Metropolitan Museum), which also adapts the cupped hand position used in the portrait of Reskimer of around 1533. This recycling presents problems for the chronology of undated pictures.

The dating of *A Lady with a Squirrel and a Starling* has usually been within the period of Holbein's first visit to England of 1526–8. The fur cap (now identified as Russian ermine)³¹ is very similar to that worn by Margaret Giggs for the More family portrait sittings of this period (Fig. 1). The white shawl and bodice of the dress also resemble those worn by Margaret Giggs but also can be related to other portraits of women which are slightly later in date.³²

Vine leaves are used as a background in several Holbein portraits, as well as in two religious compositions, *The Last Supper* in Basle, which has been dated to around 1524, and the *Meyer Madonna* (Plate 5).

The latter is datable to *c.* 1525–9 from changes to the sitters which appear to have been made as a result of events while Holbein was away in England.³³ On this first visit Holbein painted the portraits of Sir Henry and Lady Guildford, dated 1527 (Figs. 8 and 9). Both these have vine leaves in the backgrounds. Leaves were used again in a portrait from the second visit, that of Derich Born (Fig. 7) of 1533 and also in that of William Reskimer (Fig. 6) usually dated to the same period.

The leaves in *A Lady with a Squirrel and a Starling* are similar to but not identical with the leaves in any of these paintings. In fact, Holbein does not appear to have repeated either the individual clusters of leaves or the arrangements which they form. As with his figures, he seems to have preferred to vary subtly the angles from which the leaves may be seen, as well as selecting slightly different formations of leaves and branches. In *A Lady with a Squirrel and a Starling* there is no evidence of alterations to the leaves during painting, and there is no underdrawing visible owing to the presence of the blue background; however, as has been seen, the presence of drawing here can be detected in cross-sections. No preparatory drawings of leaves survive, but it may be surmised that Holbein kept sketches of such vine leaves to adapt and re-use. There does appear to be a slight difference in the effect created by the leaves in the portraits of Born and Reskimer, where they are more numerous and the

background appears darker and the effect bushier, and that in the *Meyer Madonna* and the portraits of the Guildfords, where the effect is sparser. The background of *A Lady with a Squirrel and a Starling* is closer to the latter. The vine leaves are used in paintings over a period of at least eight years, but they appear to cease to be used a couple of years into Holbein's second visit to England. The portraits in which they occur, those of Born and Reskimer, also show an abundance of branches, which differs from the sparser treatment in *A Lady with a Squirrel and a Starling* and the portraits of the Guildfords and the *Meyer Madonna*. While this cannot be conclusive, the treatment of such areas as the flesh and the lower edges of the shawl also point to a date in the 1520s rather than the early 1530s.

In *A Lady with a Squirrel and a Starling* the immaculate and accurate technique of the painted surface coupled with Holbein's known use of preparatory drawings is belied by the subtle alterations and adjustments revealed in the results of the examination of the painting described above. While the introduction of the squirrel must surely have been made at the sitter's request, other adjustments during the course of the making of the picture, such as the simplification of the folds of the shawl and the change of outline to the cap, must have resulted from decisions taken by Holbein as he worked, yet again varying a half-length theme.

Notes and references

1. The picture is No. 28 in John Rowlands, *The Paintings of Hans Holbein the Younger. Complete Edition*, Oxford 1985. For the correct earlier provenance however see F. Grossman, 'Holbein Studies – II', *The Burlington Magazine*, 93, 1951, p. 112, also S.A.C. Dudok van Heel, 'Een Holbein uit de Collecties Six', *Amstelodamum*, 1992, pp. 51–5.
2. Michael Levey, *The German School*, National Gallery catalogues, London 1959, p. 55.
3. Susan Foister, *Holbein and his English Patrons*, unpublished University of London Ph.D. thesis, pp. 70–9 and Appendix III, pp. 511–12.
4. Susan Foister, *Drawings by Holbein from the Royal Library Windsor Castle*, New York 1983; Maryan Ainsworth, 'Paternes for Phiosionamyas', *The Burlington Magazine*, 132, 1990, pp. 173–86, especially p. 176 note 25 for the technique of transference.
5. For some examples see Foister, Ph.D., *op. cit.*, pp. 73–5.
6. For the drawings see K.T. Parker, *The Drawings of Holbein in the Collection of His Majesty the King at Windsor Castle*, London and Oxford 1945, reprinted with an appendix by Susan Foister, New York 1983; also Jane Roberts, *Drawings by Holbein from the Court of Henry VIII*, exhibition catalogue, Houston 1987, and Christian Müller, *Hans Holbein d. J. Zeichnungen*, exhibition catalogue, Basle 1988. For drawings including hands see Parker, *loc. cit.*, Nos. 6, 22, 23, 39, 57, though the drawings have been cut in many instances; for detailed drawings of the hands of Erasmus, which were nevertheless altered in the underdrawing stage, see Elisabeth Foucart-Walter, *Les peintures de Hans Holbein le Jeune au Louvre*, exhibition catalogue, Louvre, Paris 1985, pp. 22–3.
7. Identified by SEM, EDX and staining with amido black 10B.
8. The sealing layer over the ground does not fluoresce in ultra-violet light under the microscope, and stains positively with sudan black.
9. In certain cross-sections particles of very fine black underdrawing are present, perhaps of lampblack in some kind of medium. If this is correct, the drawing would have been executed in an ink or dilute paint.
10. German sixteenth-century panels commonly bear a chalk ground over which a light-coloured priming in oil paint was applied. The upper priming usually contains lead white, varying quantities of some form of carbon black and in certain cases, earth pigments. Red lead (lead tetroxide, Pb₃O₄) is often included, probably as a drier. The upper priming layer in these pictures varies in tone from off-white to a warm grey or brown.
11. Smalt and indigo are more vulnerable to colour change than the mineral blues, azurite and ultramarine. Ultramarine is the most stable.
12. Cuprite (copper (I) oxide, Cu₂O) is present in the paint

- layer as a relatively high proportion of the azurite pigment.
13. The medium of the background was identified as linseed oil by GC–MS (R. White) and confirmed as oil medium by FTIR (J. Pilc).
 14. Hans Baldung Grien, *Portrait of a Man* (NG 245); South German School, 16th century, *Portrait of a Man* (NG 1232). See M. Levey, *op. cit.*, pp. 10–12 and pp. 105–6.
 15. Details of the investigation of NG 2475 before its cleaning in 1967 are recorded in the National Gallery Conservation Dossier.
 16. The portrait, out of the frame, shows at its left edge a strip of virtually unchanged blue, where the paint has been protected from light by the frame, and a partially faded strip alongside, where the paint has been in the shadow of the frame. The fully exposed background paint is the most severely faded.
 17. Examination of samples by GC–MS showed, in addition to linseed oil, the presence of dehydroabiatic acid and minor quantities of 7-oxodehydroabiatic acid in the glazing green, indicating the use of true ‘copper resinate’. This was supported by results of FTIR study. We are grateful to R. White for his analytical work on the media in NG 6540.
 18. Tabular crystalline particles of green basic verdigris, probably $\text{Cu}(\text{CH}_3\text{COO})_2 \cdot [\text{Cu}(\text{OH})_2]_3 \cdot 2\text{H}_2\text{O}$, were noted in the glaze. See H. Kühn, ‘Verdigris and Copper Resinate’, in *Artists’ Pigments: A Handbook of Their History and Characteristics*, revised and edited by A. Roy, National Gallery of Art, Washington DC, in press, p. 135, figs. G and H.
 19. Medium results from GC–MS analysis by R. White.
 20. Lead-tin yellow ‘type I’ from EDX analytical results.
 21. See A. Smith and M. Wyld, ‘Altdorfer’s “Christ taking Leave of His Mother”’, *National Gallery Technical Bulletin*, 7, 1983, plates 7a and b, pp. 50–1 and p. 62.
 22. As in, for instance, the portraits of Sir Thomas Godsalve (with his son John) and of Sir Richard Southwell (Rowlands Nos. 31, 58). Similar poses are also seen in portraits of an unknown woman at Detroit, of Mrs Pemberton, Sir Henry Wyatt, Sir Thomas More, Derich Born and Hermann Wedigh (Rowlands Nos. 54, M 5, 24, 44 and 37).
 23. See also Plate 2 and the *Last Supper*, Rowlands No. 20.
 24. For the uncut edges and the dimensions of the panels of Derich Born and William Reskimer see Oliver Millar, *Tudor, Stuart and Early Georgian Paintings in the Royal Collection*, Oxford 1963, Nos. 26 and 31. The proportions of the portraits of Sir Richard Southwell, Derick Tybis and an unknown man (Yale) (Rowlands Nos. 31, 43 and 65) also appear similar.
 25. For references to the studies of the hands of Erasmus, see note 6 above.
 26. In the study for the More family group (Rowlands, *op. cit.*, Fig. 188 and Müller, *op. cit.*, No. 65) such girdles are worn by Margaret Giggs and Margaret Roper.
 27. For falcons, see Rowlands Nos. 46 and 75, for a monkey the More family group study (Rowlands fig. 188 and Müller, *op. cit.*, No. 65), for a marmoset see Müller, *op. cit.*, No. 80. It is also worth noting that a reference by Waagen to a portrait of a woman by Holbein generally taken to be identical with that at Detroit (Rowlands No. 54) mentions a pigeon: ‘A female portrait, about a quarter life-size, with a white cap and a white pigeon’. G.F. Waagen, *Treasures of Art*, 1854, Vol. 3, p. 264.
 28. For drawings of a bat and of lambs see Müller, *op. cit.*, Nos. 44 and 45.
 29. For example compare Parker, *op. cit.*, Nos. 32 and 57.
 30. For the discussion of such alterations see note 5 above. To these observations may be added the altered under-drawn contours in the portrait of Derich Born, noted during an examination at the National Gallery in 1991 with infra-red reflectography carried out by Rachel Billinge and kindly facilitated by Viola Pemberton-Pigott and Christopher Lloyd.
 31. J.G. Links, *The Times*, 8 May 1992.
 32. The portraits of a woman at Detroit, Rowlands No. 54, and at Vienna, Rowlands No. 51 (dated 1534).
 33. See Rowlands, *op. cit.*, No. 23, and for a full discussion Hans Reinhardt, *Zeitschrift für Schweizer Kunstgeschichte und Archäologie*, 15, 1954–5, pp. 244–54.