Painting Pairs 2023-24: Art Historical and Technical Study Report

Unknown artist & date, *Mary, Queen of Scots*, Royal Collection Trust: Holyrood House Palace, Edinburgh.

CIA No. 2926

Accession No. RCIN 407498

Artist Unknown

Title *Mary Queen of Scots*

Date Unknown

Collection The Royal Collection Trust: Holyroodhouse Palace

Medium Oil on Panel

Dimensions c.30.2 x 20.4 x 0.8 cm

MA History of Art Student Sarah Brokenborough

MA Conservation of Easel Paintings Student Grace Storey

Preface

"Much as has been written about Mary Queen of Scots, it would be difficult to find in our language a biography of her that recommends itself to busy readers by its brevity, whilst furnishing data and arguments with respect to controverted points in her history, intended to give satisfaction to inquiring minds.

If the present work has done thus much, it has accomplished the aim of

THE AUTHOR[S]."[1]

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[1] Craig A. Campbell, 'Preface', in *Mary, Queen of Scots in History*, Montreal: D. & J. Saddler, 1903.

The Courtauld

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<u>Acknowledgements</u>

Abstract

This report documents the research we have conducted as part of the Painting Pairs Project, an annual program that fosters collaboration between art historians and conservators studying at The Courtauld Institute of Art. Our interdisciplinary collaboration resulted in a comprehensive technical and art-historical analysis of a portrait of Mary, Queen of Scots, intended for display at the Palace of Holyroodhouse.

The portrait, an oil painting on a wood panel (30.2 cm by 20.4 cm), now belongs to the Royal Collection Trust (RCIN 407498) and depicts Mary, Queen of Scots in attire from the late 1550s and 1560s. After 1845, when Prince Albert acquired the painting, it was displayed at the Osborne House estate on the Isle of Wight until 1902, and then moved to Buckingham Palace, a history which is documented in the multiple inscriptions on the panel verso. Over the course of the nineteenth-century, the painting was publicly displayed at two exhibitions in London that sought to compile and compare authentic portraits of Mary, Queen of Scots.

Recent dendrochronological analysis revealed that the wooden support dates to the seventeenth century, challenging previous beliefs that the painting was made during the nineteenth century. The paint surface appears to have been worked up in thin glazes, although the paint surface was initially difficult to examine owing to the considerable amount of surface dirt present. Permission was therefore sought and granted for a full surface clean.

Attributed to the French School, the painting is theorised to be derived from either a larger painting by François Roger de Gagnieres or a copy drawn by Louis Boudan. The primary objective of this research is to utilise a technical analysis focusing on the materials and techniques used in the painting, and an art-historical analysis on the iconography and social uses of Mary, Queen of Scots portraits to better situate Prince Albert's acquisition within the field of Marian studies. More specifically, we aim to further explore the relationship between *Mary, Queen of Scots* (RCIN 407498) and Louis Boudan's drawing.

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Introduction

Introduction to the Project

This report documents the research we have conducted as part of the *Painting Pairs Project,* an annual program that facilitates a close collaboration between art historians and conservators studying at The Courtauld Institute of Art. Our project has been made possible through the support of The Courtauld Institute of Art, The Department of Conservation and Technology, the Research Forum, and the Royal Collection Trust.

Our interdisciplinary collaboration resulted in a technical and art-historical analysis of a portrait of Mary, Queen of Scots that is due to be publicly displayed at the Palace of Holyroodhouse.

Introduction to the Painting

This particular portrait of Mary, Queen of Scots (1542 - 1587) consists of oil on a wood panel, measuring 30.2 cm in height, 20.4 cm in width, and 0.8 cm in depth, and is held at the Royal Collection Trust (RCIN 407498). It is a full-length portrait with Mary, Queen of Scots turned slightly to the left, and prominently displays a women's dress typically associated with the late 1550s and 1560s. The royal figure rests one hand on a red chair dotted with gold-coloured fleur-de-lis, alluding to her status as the Queen of France from 1559 to 1560.

This painting has been attributed to the French School and while originally believed to be from the nineteenth century based on the style and acquisition history. A recent dendrochronology report conducted by Ian Tyres, on behalf of the Royal Collection Trust has dated the panel to the seventeenth-century after the wood was found to match southern German reference data and a *Terminus post quem* (or earliest date possible) of 1617 was established.

Marian scholars and a RCT curator have supplied us with a working theory that the portrait was painted after a larger life-size painting belonging to François Roger de Gagnieres (1642-1715) or a drawing of said painting by Louis Boudan (c. 1670 - c.1718). The central aim of our research is therefore to determine the relationship between this painting of Mary, Queen of Scots (RCIN 407498) and the drawing by Louis Boudan.

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Provenance

Very little is known of the painting prior to its acquisition by Prince Albert in 1845.[2]

From 1845, The provenance can be traced through the variety of labels and inscriptions present on the verso. (see appendix I, plate 2 and appendices III and IV).

The acquisition by Prince Albert is evidenced in his personal brand (location 8 appendices III and IV) along with the VR insignia for "Victoria Regina" located on the back of the panel. (location 6, appendices III and IV) It is also documented in an entry in Prince Albert's acquisitions catalogue and reads: No 204. Capt. Munro, Portrait of Mary Queen of Scots, 1 July 1845, £31 10s 0d [-], although little information can be found as to the identity of Captain Munro.[3]

Another stamp (location 7, appendices III and IV) places the painting in the Osborne inventory of 1876, referencing Osborne House, on the Isle of Wight. Queen Victoria and Prince Albert took possession and furnished this residence in the spring of 1845.[4] Prince Albert reportedly arranged his personal collection of paintings at Osborne himself.[5]

George Scharf (1820-1895) the First director of the National Portrait Gallery references the portrait in 'A brief account of a Small Portrait of Mary Queen of Scots: Preserved at Osborne House, in the Isle of White, Addressed to John Evans, Esq. President, by George Scharf, Esq.' read on the 22nd November 1888. This address noted that the painting was at Osborne House, although later in the same publication clarified that Queen Victoria ordered the painting be brought from "Barton Farm, near Osborne House, to Buckingham palace" for Scharf to inspect in June 1888.[6] A later book by Lionel Cust based on Scharf's research, again references the

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[2] Information supplied via personal and emailed correspondence with Emma Stead, Palace Curator at Holyrood House Palace, December-January 2023-2024.

[3] Correspondence with Emma Stead at The Courtauld Institute of Art, December 2023.

[4] Whitaker, L. 'Preparing a handsome picture frame to pattern chosen by HRH The prince': Prince Albert Frames his collection', *Victoria & Albert: Art & Love Essays from a study day held at the National Gallery London on 5 and 6 June 2010,* London: Royal Collection Trust, 2012, p. 13.

[5] Whitaker, L. 'Preparing a handsome picture' *Victoria & Albert: Art & Love Essays,* London: 2012, p. 13.

[6] Scharf, G. A brief account of a Small Portrait of Mary Queen of Scots: Preserved at Osborne House, in the Isle of White, Addressed to John Evans, Esq., President, by George Scharf, Esq., C.B., F.S.A', *Archaeologia: or Miscellaneous Tracts relating to Antiquity,* Vol. LI, London: Society of Antiquaries of London, 1888, pp.469-470.

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painting as being housed at Barton Farm, but like Scharf uses "Osborne" indiscriminately to encompass both properties.[7]

The painting was transferred in a more long-term move to Buckingham Palace in 1902, evidenced in the label fragment to the left of the panel with a possible interpretation of the inscription being "from Osborne" and the date (location 2, appendices III and IV). According to Cust, it was hung "in the private apartments of her Majesty Queen Alexandra".[8]

From Buckingham palace a typed label on the panel verso notes (location 3, appendices III and IV) that the painting was moved to another royal palace, Windsor Castle on 24 June 1926, where a final paper label confirms its presence. (location 4, appendices III and IV).[9]

The painting is now owned by the Royal Collection Trust as part of the collection at Holyrood House Palace in Edinburgh.[10]

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[7] Cust, L. *Notes on the Authentic Portraits of Mary Queen of Scots Based on the Researches of The Late Sir George Scharf, K.C.B. Rewritten in the Light of New Information by Lionel Cust,* London: John Murray, 1903, pp. 127-130. & Email correspondence with Emma Stead, Palace Curator at Holyrood House Palace.

[8] Cust, L. *Notes on the Authentic Portraits of Mary Queen of Scots,* London: 1903, p. 128.

[9] Information confirmed by correspondence with Emma Stead December-January 2023-2024.

[10] information supplied via personal and emailed correspondence with Emma Stead, Palace Curator at Holyrood House Palace and Nicola Christie, Head of Paintings Conservation at the Royal collection. December-January 2023-2024.

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Condition Report and Surface Cleaning

The Osborne Portrait initially entered the Courtauld Conservation Department solely for technical analysis to be undertaken as part of this Painting Pairs project. The condition of the painting upon its arrival was good, and the painting did not require any immediate structural treatment.

Primary Support

The primary support, visible from the verso in plate 2, appendix I, is a single wooden board with no joints, most likely oak, owing to the pronounced vertical grain on the verso.

There are multiple inscriptions on the panel verso referring predominantly to the providence of the painting which have been documented in appendices III and IV.

None of the panel edges appear to be bevelled. The verso bears some localised losses and indents where nails appear to have been used to fix the painting into a frame but appears overall stable and in good condition.

Ground and Preparation

The white coloured ground appears to be bulky and thickly applied. It is visible in some small, localised losses present in the floor of the composition (plate 1, appendix I). There is evidence of the ground extending to the edges of the panel on each side.

It was not possible to discern the presence of an underdrawing by visual analysis either by the naked eye or through microscopic analysis.

Paint Layers

The paint surface appears to have been worked up in thin glazes, although it was initially difficult to look closely at the paint surface owing to the considerable amount of surface dirt present.

The green background appears very thinly, almost transparently painted, and appears to have been applied near the end of the painting process with only the white details applied atop it.

There are pronounced drying cracks especially in the green background which appear to have been locally retouched. It is highly likely that a previous attempt has been made to tone these cracks out and make them appear less visually disruptive.

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Upon inspection under a microscope the retouchings are visible and are cooler toned than the original paint, yet they are not overly disfiguring when viewed from a distance.

The overall condition of the paint is good, although as hitherto mentioned, there are some localised losses visible in the painted floor which appear to have been caused by delamination between the paint and ground layer. The losses presently appear stable, and the delamination does not seem to be ongoing.

Surface Coatings

There a degraded and yellowed varnish is present across the composition which, upon inspection under a microscope, appears to have crazed in several areas.

There is a thick layer of surface dirt across the surface of the painting which is not only visually disruptive, but obscures details in the paint below. There are several drips on the painted surface which are emphasised by the surface dirt, which has moved to form tidelines around them along with some surface accretions (fig 1).

A white substance appears to have stuck to the paint just above the bottom edge on the right of the painting (fig 2).

Upon close inspection and under the microscope it is possible to identify areas where surface cleaning tests have previously been undertaken and some of the surface dirt removed, although further treatment was not ultimately undertaken.

Figure 1.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment.
Micrograph detail of surface dirt and accretions forming tidelines where something has dripped onto the painting.

Figure 2.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment
Micrograph detail of white material stuck to the surface of the painting near the bottom edge.

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Surface Cleaning

The surface dirt present on the painting limited visibility of the composition. Thus the degree of visual analysis possible could be significantly improved by the removal of surface dirt. The general appearance of the painting would also be greatly improved which was of importance to the owners, since the curator of Holyrood House Palace had expressed the desire for this painting to be displayed in the future.

Permission was therefore sought, and granted for a full surface clean that was subsequently carried out using saliva applied with cotton swabs and cleared with deionized water. This proved to be an effective method for removing most of the surface dirt and improving the compositions visibility, which can be seen in the contrast between cleaned and uncleaned areas in figure 3, photographed under normal light, and figure 4 photographed under ultraviolet light.

The white zinc containing material present just above the bottom edge on the right-hand side of the painting was also effectively solubilised and removed by this method.

Before and after treatment pictures can be seen in plates 1 and 10 in appendix I.

Figure 3.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Photograph taken in normal light during treatment to show the contrast between cleaned and uncleaned sections of the painting.

Figure 4.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Photograph taken in ultraviolet light during treatment to show the contrast between cleaned and uncleaned sections of the painting.

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Art Historical Analysis

Abbreviated Biography of Mary, Queen of Scots

Historians of Tudor England, Scotland, France, religion, military strategy, and politics have all contributed to a rich historiography on Mary, Queen of Scots. A constant stream of historical novels, biographies, films, television shows, museum exhibitions, and theatrical productions have further contributed to the popular historiography of Mary, Queen of Scots and her cultural impact on society today.[11]

However, this report primarily focuses on her visual representations in painting and print, rather than attempting to address her complex historical record or the immense amount of visual culture that has been built around myths and facts derived from the historical subject.[12] We have included an abbreviated biography, reflective of current scholarship to provide further historical context:

Born in Scotland in 1542, Mary Stuart (also referred to as Mary Stewart) became the Queen of Scotland less than one week after her birth, due to the death of her father James V. In 1547, she moved to France, Scotland's ally, and became betrothed to her first cousin Francois, Dauphin of France, son of Henri II and heir to the French throne. In 1558, at the age of 16, Mary, Queen of Scots married the Dauphin, who then ruled as Francis II, the King of France from 1559 to 1560. In 1561, after the king's death, Mary, Queen of Scots returned to Scotland. After two disastrous marriages to Henry Stuart, Lord Darnley in 1565, and following his assassination, to James Hepburn, the 4th Earl of Bothwell in 1567, she was imprisoned and forced to abdicate in favour of her infant son, James VI. After escaping imprisonment at Lochleven Castle, Queen Mary was defeated at the Battle of Langside in 1568, and fled to England where she was

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[11] For a general overview of the popular historiography of Mary, Queen of Scots, see: S. Culpepper, *Long May She Reign: Portrayals and Interpretations of Mary, Queen of Scots, in Popular Media*, Paper presented at the Second Annual Center for Medieval and Renaissance Studies Conference at St. Louis University in St. Louis, Missouri, June 16, 2014; J. M. DeSilva and E. K. McGuire, "Revising Mary Queen of Scots: from Protestant Persecution to Patriarchal Struggle," *Journal of Religion & Film* 25, 1 (2021): Article 59; Ingibjörg Ágústsdóttir, "Mary Queen of Scots as Feminine and National Icon: Depictions in Film and Fiction", *Études écossaises* 15 (2012): 75-93.

[12] For more detailed biographies, see: Antonia Fraser, *Mary Queen of Scots*, Weidenfeld & Nicolson, London: 1969; John Alexander Guy, *'My heart is my own': The life of Mary, Queen of Scots*, London, Fourth Estate, 2004; Retha Warnicke, *Mary Queen of Scots,* Routledge, New York: 2006; and, Jenny Wormald and Anna Groundwater, *Mary Queen of Scots: A Study in Failure*, Edinburgh: Birlinn, 2017.

subsequently imprisoned until her execution, at age 44, at Fotheringhay Castle on February 8, 1587. Mary, Queen of Scots was buried in Peterborough Cathedral, until 1612 when her son James VI and I had her body exhumed and placed in Westminster Abbey.

Iconography of Mary, Queen of Scots Paintings

There are approximately fifty images that can be directly related to Mary, Queen of Scots. These contemporaneous portraits range from prepartorial material, coins, engravings, and paintings made during her lifetime or the two to three decades following it, sometimes from earlier portrayals, and contain multiple references to her political, religious, and royal legacies.[13]

They also depict a range of emotions, including happy, sad, stern, relaxed, or formal countenances, coupled with a style of dress that incorporates various colours, textures, and patterns, jewellery and hairstyles. While a detailed analysis of the history of Mary, Queen of Scots in art and literature remains outside the scope of this project, it is important to provide a brief overview of the Mary, Queen of Scots portraiture to provide some art-historical context.[14]

16th Century

For a figure of such prominence, it is remarkable to have such a relatively small pictorial legacy. Of the portraits made during Mary, Queen of Scots' lifetime, only a small number of these portraits have been deemed to be "authentic", in that they faithfully reproduce her most accurate anatomical countenance.[15] These sixteenth–century portraits have been utilised for numerous publications, engraved copies, and debates surrounding the "true likeness" of Mary, Queen of Scots.

As a child, Mary, Queen of Scots was drawn several times by the French court artist François Clouet (c.1520-1572). Francois Clouet's drawings serve as the earliest known images of Mary, Queen of Scots and have been unanimously accepted as authentic portraits of the monarch (figure 5).

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[13] Helen Smailes and Duncan Thomson, *The Queen's Image: A Celebration of Mary, Queen of Scots*, Edinburgh: Scottish National Portrait Gallery, 1987, p. 11.

[14] For a general overview of portrayals of Mary, Queen of Scots, see: Jayne Lewis, "The Reputations of Mary Queen of Scots", *Études écossaises*, 10 (2005): 41-55.

[15] For a general overview of sixteenth-century perceptions of Mary, Queen of Scots: Alexander Wilkinson, *Mary, Queen of Scots and French Public Opinion, 1542-1600*, New York: Palgrave Macmillan, 2004.

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  François Clouet's drawings, especially the one commonly referred to as the 'en deuil blanc' (in white mourning) portraits, have also served as the source for several painted and engraved copies (figure 6).[16] The 'en deuil blanc' portrait was drawn after Mary, Queen of Scots had lost three of her loved ones within the span of eighteen months: her father-in-law Henry II in 1559, his mother Marie de Guise in June 1560, and her husband Francois II in December 1560. Clouet's 'en deuil blanc' drawing is an immensely popular and intimate portrayal of Mary, Queen of Scots and highly valued due to it being produced during her lifetime.[17]

Figure 5.
François Clouet, *Marie Stuart,* 1552, 28 x 20.5 cm, coloured chalk on paper, Musée Condé, Château de Chantilly, Inventory Number: MN 38. *Photo © RMN-Grand Palais) / René-Gabriel Ojéda.*

Figure 6.
François Clouet, *Marie Stuart Reine d'Ecosse en deuil blanc*, c.1561, 28 x 18.4 cm, coloured chalk on paper, Bibliothèque Nationale, Paris. Accession Number RESERVE NA-22 (17)-BOITE (Planche 4). Image Courtesy of BnF (Public Domain).

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[16] Forrest P. Chisman, "The Portraits of Mary, Queen of Scots, 'En Deuil Blanc': A Study in Copying," *The British Art Journal* 6, no. 2 (2005): 23–27; p. 23.
[17] Forrest P. Chisman, "The Portraits of Mary, Queen of Scots, 'En Deuil Blanc', *The British Art Journal,* 2005: p. 23.

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Sheffield Portrait

The 'Sheffield Portrait' (figure 7), also known as the captivity portrait, is considered to be a rare ad vivam portrait of Mary, Queen of Scots.[18] Up until the twentieth century, this particular painting was thought to derive from an original portrait (now lost) painted during Mary, Queen of Scots' captivity at Sheffield Castle. Today, the majority of Marian scholars and curators agree that the Sheffield portrait was *not* painted during her lifetime.[19] However, the debate continues due to the fact that the date inscribed on the painting, 1578, fails to correspond with the figure's dress and composition, which is more commonly associated with Jacobean portraits made during the seventeenth century.[20]

Like many of Mary, Queen of Scots' posthumous imagery, the 'Sheffield Portrait' attempts to rehabilitate her reputation by depicting the monarch as a Catholic martyr. Interestingly, Mary, Queen of Scots' monumental effigy (figure 8) at Westminster Abbey also derives from the 'Sheffield Portrait.[21] Additionally, Nicholas' Hilliard miniatures (figure 9), which also derive from the Sheffield Portrait, became the source material for several seventeenth-century portraits. For example, one portrait painted by Daniel Myten (Figure 10) used the Hilliard miniature as its source material and went on to be the basis for several eighteenth-century engravings.

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[18] See: *Mary, Queen of Scots (1542–1587), aged 36.* (Chesterfield, UK: National Trust - Hardwick Hall, n.d.) Image Caption.
[19] Smails and Thomson, *The Queen's Image*, Edinburgh: 1987, p. 53.
[20] See: Jeremy L. Smith, "Revisiting the Origins of the Sheffield Series of Portraits of Mary Queen of Scots." *The Burlington Magazine* 152, no. 1285 (2010): 212–18.
[21] See: Jeremy L. Smith, The Sheffield Portrait types, Their Catholic purposes, and Mary Queen of Scots's Tomb. *British Catholic History, 33, no.* 1 (2016): 71-90.

Figure 7.
By or After Rowland Locke, *Mary, Queen of Scots*, c. 1578, oil on panel, 193.5 by 112 cm, Hardwick Hall, Inventory Number: NT 1129104.
Image Copyright © NTPL/John Hammond.

Figure 8.
William and Cornelius Cure, *Tomb of Mary, Queen of Scots*, Rance marble, white marble, touchstone, and gilding, Westminster Abbey.
Image: The Royal Collection © His Majesty King Charles III.

Figure 9.
Nicholas Hilliard, *Mary, Queen of Scots*. c.1592. Watercolour on
vellum, 4.4 by 3.8 cm, Royal Collection Trust,
Inventory Number: RCIN 420641.
Image Copyright © His Majesty King George III.

Figure 10.
Daniel Mytens (c. 1590 - 1647) after
Nicholas Hilliard (1547-1619), *Mary, Queen
of Scots*, c. 1627, oil on canvas, 214.2 x
125.7 cm (support, canvas/panel/stretcher
external), Royal Collection Trust, Inventory
Number: RCIN 401182. Image Copyright ©
His Majesty King George III.

17th Century

'The Blairs Memorial Portrait' serves as one of the final authentic portrait paintings derived from an image created during Mary, Queen of Scots' lifetime (figure 11). Belonging to Elizabeth Curle who most likely felt a personal need, as Mary's lady-in-waiting, to memorialise the queen she served, this portrait has been often used to illustrate a more sympathetic portrayal of Mary, Queen of Scots.[22] This posthumous portrait portrays Mary Stuart as a 'daughter of the Roman Church' as she stands next to a scene recounting her violent death.[23]

Figure 11.
Unknown Artist, *Mary, Queen of Scots* ['The Blairs Memorial Portrait'], c. 1600, oil on canvas, 227 x 139 cm, Blairs Museum, Accession Number: T9103BLRBM.

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[22] Smails and Thomson, *The Queen's Image*, Edinburgh: 1987, p. 54.
[23] See: Margueritte Tassi, "Martyrdom and Memory: Elizabeth Curle's Portrait of Mary, Queen of Scots," in Barrett-Graves, D. (ed), *The Emblematic Queen: Extra-Literary Representations of Early Modern Queenship,* New York: Palgrave Macmillan, 2013, pp. 101-132.

18th Century

During the eighteenth century, several romanticised portraits of ladies wearing costumes of varying periods and countries were believed to be authentic portraits of Mary Queen of Scots. Many of these portraits are now known to have been misidentified, intentionally fabricated (figure 12) or altered versions of contemporary portraits (Figure 13).[24]

Furthermore, during the eighteenth century, the print industry was rapidly expanding, which allowed more members of the general public to access, collect, and compare printed portraits of historical figures such as Mary, Queen of Scots. In 1717, the newly re-established Society of Antiquaries' hired George Vertue to engrave and publish authentic historical portraits, many of which served as illustrations for several historical biographies (Figure 14). For example, James Granger's *A Biographical History of England* contained brief biographies of historical figures and directed readers to Vertues' engravings of Mary, Queen of Scots.[25] Also, due to technological advances, lithographic prints were able to produce facsimile-autographed portraits of historical figures. In effect, new technologies were deployed to declare certain printed images as authentic and authorised portrayals of Mary, Queen of Scots (Figure 15).[26]

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[24] Roy Strong, *Tudor & Jacobean Portraits, Volume 1,* London: National Portrait Gallery, 1969, p. 222.

[25] James Granger, *A Biographical History of England, from Egbert the Great to the Revolution: Consisting of Characters Disposed in Different Classes, and Adapted to a Methodical Catalogue of Engraved British Heads : Intended as an Essay Towards Reducing Our Biography to System, and a Help to the Knowledge of Portraits : Interspersed with Variety of Anecdotes, and Memoirs of a Great Number of Persons,* London: J. Rivington and Sons, 1779, p. 182-185

[26] Tom Young, "The 'Autographic Self': Facsimile Signatures and Lithographic Portraiture at the Crossroads of Liberalism, Romanticism and Nationalism, c. 1800–60," *Cultural History* 12, no, 2 (2023): pp. 168-200.

Figure 12.
Bernard Lens, *Portrait, Supposedly of Mary Queen of Scots*, early 18th century, watercolour on ivory, 52 x 74 mm, Victoria & Albert Museum, Accession Number: P.62-1987.
Image © Victoria and Albert Museum, London.

Figure 13.
Unknown Artist [formerly attributed to F. Zucchero], Mary, Queen of Scots, 18th century (made) [pseudo 16th century], oil on copper, Diameter: 2.625 in, the Victoria & Albert Museum, Accession Number: P.26-1942.
Image © Victoria and Albert Museum.

Figure 14.
George Vertue (1684 - 1756) after Daniel Mytens (about 1590 - about 1647), Mary, Queen of Scots, 1542 - 1587. Reigned 1542 - 1567, 1729, line engraving on paper, 15.88 x 8.89 cm, Scottish National Portrait Gallery, Accession number: SP I 23.8. Image Courtesy of Scottish National Portrait Gallery (Creative Commons - CC by NC).

Figure 15.
Unknown Artist (after Daniel Mytens, about 1590 - about 1647), *Mary, Queen of Scots, 1542 - 1587. Reigned 1542 - 1567*, c. 18th century, line engraving on paper, 9.22 x 7.95 cm, Scottish National Portrait Gallery, Accession number: SP I 23.116. Image Courtesy of Scottish National Portrait Gallery (Creative Commons - CC by NC).

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19th Century

Victorian critics and connoisseurs agreed that the Clouet drawings, and paintings made after the drawings, were authentic portraits. However, a rise in antiquarianism during the nineteenth century led to a renewed search for the 'true likeness of Mary', Queen of Scots.

The desire to locate and authenticate more portraits of Mary, Queen of Scots led to many antiquarians, scholars, and curators to proclaim, at times incorrectly, a wide variety of images to be authentic portraits. These claims were often published and widely discussed by Marian specialists, including: Prince Alexandre Labannoff's *Notice sur la Collection des Portraits de Marie Stuart appartenant au Prince Alexandre Labanoff* (1860)*,* George Scharf's 'Observations of Scots', in the *Proceedings of the Society of Antiquaries* (1876), J.J. Foster's *Concerning the True Portraiture of Mary, Queen of Scots* (1904), A. Lang's *Portraits of Jewels of Mary Stuart* (1906), and K. Martin's 'The Portraits of Mary, Queen of Scots', in *Burlington Magazine* (1906). Even the National Portrait Gallery had acquired a painting (figure 16) in 1860 based on a report compiled in 1845 by Patrik Fraser Tytler titled, *On the Portraits of Mary, Queen of Scots: With Remarks on an Original Picture of the Princess Recently Discovered.*[27]

Sir George Scharf (Founding Director of the National Portrait Gallery) and Sir Lionel Cust (his successor) had taken on the task of cataloguing and publishing a list of 'authentic' portraits of Mary, Queen of Scots. Scharf was unable to publish the work before his death, and Cust completed and published the result of their combined efforts in 1903, which remains the fullest survey of Mary, Queen of Scots portraiture, albeit out of date in some respects.[28] According to contemporary sources, Cust's publication provided much more definitive and conclusive results than Prince Alexandre Labanoff's *Notices sur la Collection des Portraits de Marie Stuart*, which was seen as the first serious attempt at compiling a survey of authentic Mary, Queen of Scots portraits.[29] Additionally, Cust's publication prompted many critics to disregard their traditional belief that Mary, Queen of Scots' supposedly renowned beauty be used

[27] Roy Strong, *Tudor and Jacobean Portraits,* London: 1969, p. 217-218.

[28] See: Lionel Cust, *Notes on the authentic portraits of Mary Queen of Scots based on the researches of the late Sir George Scharf, K.C.B. / Rewritten in the light of new information,* London: J. Murray, 1903. For Scharf's notes, see: *The Authentic portraits of Mary, Queen of Scots, 1888-1889*, The National Portrait Gallerys Heinz Archive and Library, Reference Number: NPG7/3/3/19; *Portraits of Mary, Queen of Scots: Research Material*, 1867-1909, The National Portrait Gallerys Heinz Archive and Library, Reference Number: NPG7/3/3/19.

[29] Unknown Author, "Portraits of Mary Stuart", in *The Connoisseur: An Illustrated Magazine for Collectors,* vol. 1, no. 8 (January - April 1904), London: Otto Limited, 1904, p. 184.

as measure of authenticity, as they saw many of the features in Cust's authenticated portraits as unattractive.[30]

Figure 16.
Unknown Artist, *Unknown Woman, Formerly Known as Mary Queen of Scots* [purchased in 1860 as *Mary, Queen of Scots*], c. 1570, oil on panel, transferred to canvas, 96.2 cm x 70.2 cm, National Portrait Gallery. Catalogue Number: NPG 96. Image © National Portrait Gallery, London.

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[30] Unknown Author, "Portraits of Mary Stuart", in *The Connoisseur*, p. 184.

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20th Century

In 1987, coinciding with the 400th anniversary of Mary Stuart's death, The National Gallery of Art in Edinburgh held an exhibition titled 'The Queen's Image: A Celebration of Mary Queen of Scots', which remains one of the most comprehensive and successful collections of Mary, Queen of Scots portrait paintings to date. This exhibition had an explicit focus on her physical appearance in authenticated portraits and posthumous history paintings. The exhibition catalogue, *The Queen's Image,* now serves as an exemplary compilation of Marian portraiture.[31]

21st Century

Subsequent scholarship and museum exhibitions have had an emphasis on her personal effects, or those attributed to her, and her cultural legacies. For example, in 2013, the National Museum of Scotland held an exhibition titled, "Mary, Queen of Scots: In My End is My Beginning," which presented a compilation of objects and images that helped contextualise the historical figure within Scottish and European history.[32] Just last year, The Hunterian Art Gallery at the University of Glasgow held an exhibition titled "The Afterlife of Mary Queen of Scots", which focused on the legend of Mary, Queen of Scots and her posthumous reputation.[33]

All in all, there is a noticeable curatorial shift away from the nineteenth-century debates on authentic portraiture and we may see more exhibits focusing on Mary, Queen of Scots' impact on modern culture and Scottish society. Especially in light of the recent publication, *The Afterlives of Mary, Queen of Scots*, edited by Steven Reid, which provides the first-ever census of Mary, Queen of Scots' material presence in Scottish and Royal Heritage Collections, with a focus on her cultural influences on today's society.[34]

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[31] See: Helen Smailes and Duncan Thomson, *The Queen's Image: A Celebration of Mary, Queen of Scots*, Edinburgh: Scottish National Portrait Gallery, 1987

[32] John Easton Law, "Review of Exhibition: *Mary, Queen of Scots (Edinburgh, National Museum of Scotland, 28 June–17 November 2013)," Renaissance Studies* 30, no. 2 (2016): 314–18, p. 318.

[33] "New Exhibition Explores The Afterlife Of Scotland's Most Controversial Monarch." University News, University of Glasgow, October 14, 2022.

[34] Steven J. Reid, *ed, The Afterlife of Mary, Queen of Scots,* Edinburgh, Edinburgh: Edinburgh University Press, 2024.

The Osborne Portrait - Royal Collection Trust, RCIN 407498

Montfaucon's Engraving

In 1969, Roy Strong formally noted that our Mary, Queen of Scots portrait was generally known as the Osborne portrait.[35] Since 1857, scholars, antiquarians, curators, and art historians have consistently viewed the Osborne portrait as an oil copy of an engraving in Bernard de Montfaucon's (1655-1741) *Monumens de la Monarchie Francaise* (Figures 17 and 18) which was first published in 1733. Copies of Montfaucon's engraving were widely reproduced and sold separately from his publication. One of these copies can be found at the Metropolitan Museum of Art.[36] Additionally, in 1797, John Pinkerton (1758-1826) published *Iconographia Scotica* where he notes that his engraving of Mary, Queen of Scots is a copy of Montfaucon's engraving (figure 19).[37] A copy of Pinkerton's engraving can also be found in the Royal Collection Trust.[38]

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[35] Sir Roy Strong, *Tudor and Jacobean Portraits, Vol .1,* London: 1969, p. 223.

[36] See: Unknown Printer, *Mary, Queen of Scots below two portraits of Francis II, King of France in costume*, c. 18th century, stipple engraving, Plate: 33.3 × 19.3 cm, Sheet: 39.2 × 25.5 cm, Metropolitan Museum of Art, Accession Number: 58.549.251.

[37] John Pinkerton, *Iconographia Scotica or Portraits of Illustrious Persons of Scotland Engraved from the Most Authentic Paintings &c with Short Biographical Notices*, London: Printed for I. Herbert, 1797.

[38] See: I. Herbert, T. Arrowsmith, & G. Barret, *Mary*, 1796, engraving with etching and stipple, 20.3 x 12.0 cm, Royal Collection Trust, RCIN 618177.
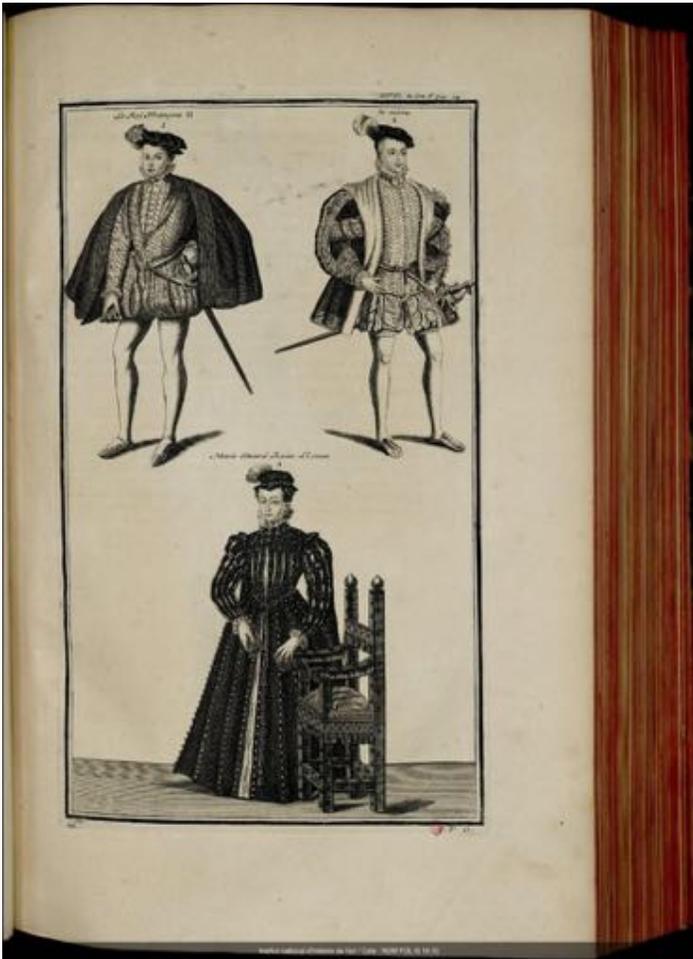
Figure 17.
Bernard de Montfaucon, *Les Monumens de la monarchie francoise, qui comprennent l'histoire de France; tome cinquiéme,* pl. xiv, 1733, 44.0 x 6.5 cm (book measurement), Institut national d'histoire de l'art, Inventory Number: NUM FOL G 14 (5). Image Courtesy of Bibliothèque Nationale de France (Public Domain).

Figure 18.
Bernard de Montfaucon, Les Monumens de la monarchie françoise, vol. 5, Julien-Michel. Gandouin and Pierre-François Giffart: Paris, 1733, Bibliothèque nationale de france, Inventory Number: FOL-LJ1-28 (5). Image Courtesy of Bibliothèque Nationale de France (Public Domain).

Figure 19.
John Pinkerton,"Mary, from Montfaucon*"*, in *Iconographia Scotica: or Portraits of Illustrious Persons of Scotland Engraved from the most Authentic Paintings &c. With Short biographical notices*, Printed for Isaac Herbert, London: 1797. Image Courtesy of Internet Archive. (Public Domain)

Boudan's Drawing

Throughout the eighteenth, nineteenth, and twentieth centuries, Montfaucon's drawing was believed to have been sourced from an unspecified drawing in François Roger de Gaignières' (1642-1715) collection.

François Roger de Gagnières was a French antiquarian, collector, and genealogist (1661-1711) with a particular interest in collecting objects related to the history of the French church and court. He sold the bulk of his collections to Louis XIV in 1711, which are now preserved in the Bibliothèque Nationale in Paris and the Bodleian Library at Oxford.[39] François Roger de Gaignièrers had commissioned Louis Boudan to produce illustrations of tombs, artefacts, and historical monuments in France between 1695 and 1715.[40]

The Bibliothèque Nationale de France now notes Louis Boudan's drawing (figure 20) as the specific source material for Montafucon's engraving. According to the inscription, Louis Boudan's drawing is a copy of a portrait painting of Mary, Queen of Scots from Gagnieres' collection. There is no further information regarding where Gagnieres sourced his painting and said painting is now presumed to be lost.

There are at least four other, altered, versions of Boudan's drawing that were made in France during the nineteenth century. These altered versions appear to have been sourced directly from the Boudan drawing (figure 21), rather than the Montfacuon print, or an amalgamation of sources (figure 22), due to the colouring of the chair and dress.

Furthermore, these altered, or diluted, versions of the Boudan drawing began to lose their meaning as portraits of Mary, Queen of Scots. For example, Boudan's drawing was initially seen as a portrait of Marie Stuart (figure 23), but later on it became a reference for sixteenth-century French women's fashion (figure 24) helping viewers identify accurate historical costumes. In effect, Boudan's drawing changed from an accurate portrait of Mary, Queen of Scots to an

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[39] Chisholm, Hugh, ed., "Gaignières, François Roger de", Encyclopædia Britannica. Vol. 11 (11th ed.), Cambridge University Press: 1911, p. 387.
[40] Elizabeth Brown,*The Oxford Collection of the Drawings of Roger de Gaignières and the Royal Tombs of Saint-Denis*, Philadelphia: The American Philosophical Society, 1988, p. 52; and Robin Middleton and Marie-Noelle Baudouin-Matuszek, *The Architect as Technician*, New Haven: Yale University Press, 2007, p. 23.

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accurate portrayal of sixteenth-century women's fashion, providing viewers with an image of what Mary, Queen of Scots may have worn.

Figure 20.
Louis Boudan, *Reine de France. Marie Stuart. Reine d'Ecosse: femme du Roy François II. Marie en 1558*, gouache on parchment, 48.5x 32 cm (parchment), and 25.5 x18 cm (image) Bibliothèque National de France, Inventory Number: RESERVE OA-17-FOL (Folio : 4). Image Courtesy of BnF (Public Domain).

Figure 21.
Unknown artist, *Marie Stuart, femme de François 2, Roi de France*, 19th century, watercolour and gouache on paper, 17.4 cm x 24 cm, Bibliothèque municipal de Rouen. Image Courtesy of Bibliothèque National de France (Public Domain).

Figure 22.
Unknown Artist, *Marie Stuart, Queen of France and Scotland*. Illustration drawn and lithographed by Madame Calon after a portrait in Roger de Gaignieres' gallery portfolio IX 4 from Le Bibliophile Jacob aka Paul Lacroix's Costumes Historiques de la France (Historical Costumes of France), Administration de Librairie, Paris, 1852.

Figure 23.
F. Roy, "Marie Stuart", engraving, in La France et les Français à Travers les Siècles, Vol. 3, by Augustin Challamel, Paris: 1884, pl. 51. Image Courtesy of Google Books (Public Domain).

Figure 24.
Marie Préval, Printed by Gilquin in Paris, "History of Fashion", in *The History of Fashion in France, or The dress of women from the Gallo-Roman period to the Present Time* by Augustin Challamel, translated from French to English by Mrs. Cashel Hoey and Mr. John Lillie, Published by Scribner and Welford, New York, printed by Gilbert and Rivington Limited, London: 1882, p. 81. Image Courtesy of New York Public Library, Internet Archive (Public Domain).

Prince Albert's Acquisition

According to his Acquisition Catalogue, Prince Albert purchased the Osborne Portrait on 1 July 1845 for £31 10s 0d. The portrait was then displayed at Osborne House on the Isle of Wight before being sent to Buckingham Palace in 1902 and then on to Windsor Castle in 1926.[41]

Prince Albert, a noted patron of the arts, had studied the history of art at the University of Bonn and was also interested in locating, compiling, and comparing authentic portraits of Mary, Queen of Scots.[42] For example, Prince Albert had purchased the Osborne portrait within the same year that Scottish art historian Patrick Fraser Tytler published *On the Portraits of Mary, Queen of Scots*.[43] And only a few years later did Pierre Gérard Jérôme Niel publish *Portraits Des Personnages Français* which included two highly detailed chromolithographs of Mary, Queen of Scots copied after François Clouet drawings, one of which was the "en deuil blanc" drawing albeit with notably redder hair (figure 25).[44] These new publications and visual sources were widely distributed, with prints copied and sold separately, and aided nineteenth-century antiquarians' search for Mary, Queen of Scots' "true likeness."

In 1856, the Archaeological Institute of Great Britain and Ireland hosted an exhibition of antiquities, works of art, and Scottish relics, under the patronage of Prince Albert, during their annual meeting. This exhibition also included portraits of Mary, Queen of Scots, and, according to the Archaeological Institute's records, cost £18 18s 7d.[45] Although the Osborne portrait was not on display, the exhibition demonstrates Prince Albert's interest in collecting, identifying, and preserving rare artistic treasurers associated with Scottish history.

From the mid-nineteenth century, photography was used to document and reproduce images of Mary, Queen of Scots paintings. Prince Albert had first displayed the Osborne portrait at an exhibition hosted by the Archaeological Institute in London in 1857 alongside several other

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[41] Information supplied via personal and emailed correspondence with Emma Stead, Palace Curator at Holyrood House Palace, December-January 2023-2024.

[42] See: "Prince Albert: His Life and Legacy." n.d. Accessed May 20, 2024: https://www.rct.uk/collection/stories/prince-albert-his-life-and-legacy.

[43] Patrick Fraser Tytler, *On the Portraits of Mary, Queen of Scots: With Remarks on an Original Picture of the Princess recently discovered. For private circulation*, London: S. & J. Bentley, 1845.

[44] Pierre Gérard Jérôme Niel, *Portraits Des Personnages Français Les plus Illustres Du XVIe Siècle: Reproduits, En Fac Simile, Sur Les Originaux Dessinnés Aux Crayons de Couleur Par Divers Artistes Contemporains*, Paris: A. Lenoir, 1848.

[45] "Abstract of Cash Account For The Year 1857", in "Proceedings at Meetings of the Royal Archaeological Institute", *The Archaeological Journal* 15, London: 1858.

paintings believed to be authentic portraits of Mary, Queen of Scots, including the one featured in Patrick Fraser Tytler's publication from 1845 (fig 16.) Prince Albert had also commissioned photographs of the portraits of Mary, Queen of Scots displayed at the exhibition and then published the photographs in 1858 as a *Series of photographs from Portraits of Mary Queen of Scots.*[46] This publication contains the earliest known photograph of the Osborne portrait (figure 26).

In the text accompanying the photographs, the Osborne portrait is described as the following:

"No. 4. Small full-length portrait in the collection of H.R.H. the Prince Consort at Osborne House.

The young Queen is represented in a black dress slashed and puffed ; she leans with her left hand on the arm of a chair. French School , similar in treatment to the Portrait engraved by Montfaucon in the *Monumens de la Monarchie Françoise.*" [47]

Although Prince Albert was aware of the similarities between the Osborne portrait and Montfaucon's engraving, we cannot determine whether he thought the Osborne portrait was a more accurate portrait of Mary, Queen of Scots. However, after Prince Albert's death, the Osborne portrait was featured in an *Exhibition on the Royal House of Stuart*, under the patronage of Queen Victoria, which was held in London in 1889 and contained a collection of Mary, Queen of Scots paintings believed to be authentic portraits.[48]

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[46] Caldesi, Montecchi, and Way, *Series of Photographs from Portraits of Mary Queen of Scots, Executed by Caldesi and Montecchi From the Collection Exhibited by the Archaeological Institute, June, 1857*, London: Printed by J.B. Nichols and Sons, Published by: P. & D. Colnaghi & Co., 1858.

[47] Scharf, *A Brief Account,* p.470.

[48] Unknown Author, "25. Mary, Queen of Scots" in *Exhibition of the Royal House of Stuart*, New Gallery, London: 1889, p. 16.

Figure 25.
Adolphe Pierre Riffaut, Marie Stuart, in *Portraits des personnages français les plus illustres du XVIe siècle, reproduits, en fac-similé, sur les originaux dessinés aux crayons de couleur par divers artistes contemporains, recueil publié avec notices par P. G. J. Niel. Première série : Rois et reines de France, Maîtresses des rois de France,* P.G. J. Niel, ed., Paris: 1848, Bibliothèque de l'Institut National d'Histoire de l'Art, Inventory Number: NUM FOL L 219 (1). Image Courtesy of INHA (Public Domain).

Figure 26.
Paul and Dominic Conalghi, "Mary, Queen of Scots," in *Séries of photographs from Portraits of Mary Queen of Scots, executed by Caldesi and Montecchi, from the collection exhibited by Archaeological Institute. June. 1857. Paul and Dominic Colnaghi, London. 1858, p*hotograph in 38 cm x 27.6 cm,1858, Musée Conde, Château de Chantilly. Inventory Number PH No 109. Image © Musée Condé. (Image Use Courtesy of Musée Condé).

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Victorian Critics

There is a notable sense of derision towards the Osborne portrait when viewed as a copy made after Montfaucon's drawing. For example, Louis Dimier described the Osborne portrait as a "bad copy with such altered features that it becomes impossible to recognise the person painted in it."[49] Even though the Osborne portrait had previously derived a level of authenticity from being a copy of a drawing in Gagnieres' collection. However, it is unclear whether Victorian critics believed Gagnieres completed the drawing himself or if Boudan had been identified as the commissioned artist. In either case, several other intermediary points of transmission, including Montfaucon's engraving, should also be noted. Especially since it is possible that the Osborne portrait was made after Pinkerton's larger scale engraving..

When comparing the Osborne portrait with other copies of the Boudan drawing there are a number of differences, most notably the facial expression, jewellery, colour of the chair, colour of the handkerchief, and the colour of the background. All the while the central composition remains the same. Additionally, the engravings only denote a striped floor, which could be interpreted in oil as a brown wooden floor. Yet, the Boudan drawing only includes horizontal lines to denote shadows next to the chair and its central figure. Furthermore, the Boudan drawing has an altogether different texture for the floor. These subtle differences help to align our Osborne portrait with the Montfaucon print rather than the Boudan drawing itself.

With so many variations, especially in regard to colour, we believe that the Osborne portrait and other similar copies (figure 27), may all derive from the printed black and white engravings of Mary, Queen of Scots rather than the coloured Boudan drawing.

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[49] Louis Dimier, "About Mary Queen of Scots' Portraits," *The Scottish Historical Review* 4, no. 14 (1907): 135–43, p. 143.

Figure 27.
Unknown Artist, *Marie Stuart*, oil on panel, 66.5 x 40 cm, before 1910, Inverness Museum and Art Gallery. Accession Number: INVMG 0000.368. Image Credit - Highland Council.

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The Osborne Portrait at Osborne House

The 1870-74 Osborne House Inventory notes that the portrait was displayed in Queen Victoria's Sitting Room.[50] However, neither the 1900 Picture Inventory nor the 1876 Picture Inventory for the Queen's Sitting Room at Osborne House list any portrait of Mary Queen of Scots.[51] The Osborne House property also included Barton Farm next door which was used to house Queen Victoria's ladies-in-waiting and other household staff. In either case, the Osborne portrait was consistently displayed at private royal residences, at either the Osborne House, Barton Farm, or Buckingham Palace, and away from the public eye. When situated in these intimate and domestic settings, the Osborne portrait can be interpreted as material culture with a social function, rather than as a static historical object with a singular meaning or purpose.

The Osborne portrait now prompts us to consider how Prince Albert, Queen Victoria, and other Scottish antiquarians, viewed Mary, Queen of Scots portraits as historical artefacts. In effect, asking us to focus more on Victorian attitudes towards Mary, Queen of Scots and less about her physical appearance.

We also strongly believe that studies of Marian portraiture are ripe for additional research regarding the multifaceted uses of nineteenth-century prints as the intermediary points of transmission between Prince Albert and Queen Victoria's oil painting of Mary, Queen of Scots and Louis Boudan's drawing. Also, more technical analyses can provide useful information that can then help us make sense of the relationships between various portraits of Mary, Queen of Scots as paintings, drawings, and engravings.

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[50] Information supplied via personal and emailed correspondence with Emma Stead, Palace Curator at Holyrood House Palace, December-January 2023-2024.

[51] Information supplied via personal and emailed correspondence with Osborne House Curator Christopher Warleigh-Lack, April-May 2024.

<u>**Technical Analysis: Materials and Techniques**</u>

A technical analysis of *The Osborne Portrait* was undertaken in the Courtauld Conservation department in an attempt to understand the materials and techniques used to execute this painting. One of the key aims of this analysis centred around establishing whether materials such as pigments with known introduction dates could be identified, in the hope that they could stand as indicators for when the composition was undertaken, allowing for a greater understanding of where this particular painting is situated within the wider context of images of Mary Queen of Scots.

An explanation of the imaging and technical examination methods used is provided in appendix II along with the equipment used.

Primary Support

Dendrochronology was undertaken on the panel support of this painting by Ian Tyers in February 2023.[52] Tyres stated that the board is comprised of a single vertical oak board and confirmed the observations made by George Scharf in 1888 that it has no bevelling on the reverse edges.[53] Scharf had commented that the board was "very thin, flat and sound".[54]

The panel contains heartwood but no sapwood along the outer edge and thus will be more resistant to warping.[55] The absence of sapwood additionally meant that a *terminus post quem* or earliest possible date could be provided. The board ring width series was found to match reference data from Southern Germany which indicated that the board was still growing as late as 1609.[56] As the minimum expected number of sapwood rings for wooden material sourced in Germany is eight, this figure was added to the latest hardwood ring, which in this case was

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[52] Tyers, I. 'Mary Queen of Scots, attributed to British School', *Tree-ring analysis of 4 panel paintings from the Royal Collection,* Dendrochronological Consultancy Report, unpublished, February 2023, pp. 11-13.

[53] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11. & Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 472.

[54] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 472.

[55] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

[56] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

present at the lower end of the board, and furnished the panel with a *terminus post quem* date of c. 1617.[57]

The fact that the board is derived from a German source is interesting. Although German sourced wood was found in both panels and furniture in Britain during the 17th and 18th centuries, it was initially less common than Baltic oak and was uncommon for objects made before 1650.[58] Post 1650 however, the region became the most predominant source of imported oak until the late 18th century. It could be the case then that the panel was imported during this time.[59]

A *terminus post quem* date of c.1617 is of further interest as prior to this dendrochronology report being produced it was believed that the painting was produced during the reign of Queen Victoria (1837-1901). This date of more than two centuries earlier would therefore have very significant implications about how this portrait would fit into the wider iconography of Mary Queen of Scots.

There are several other examples of portraits of Mary Queen of Scots, which were originally believed to be from later centuries, but which have since been allocated a much earlier date owing to dendrochronological analysis. The National Portrait Gallery owns a portrait, (Figure 28) by an unknown artist, which was previously believed to date from the 18th century until dendrochronological analysis dated it to between 1560 and 1592.[60] Dr. Tarnya Cooper, curator of 16th century paintings at the National portrait Gallery stated that "the picture has not been on display for a long time because it was thought to be a much later copy, so it is very satisfying to find out that the picture is far more important than we previously thought, and can put it on public display".[61] In this case, the painting's earlier date, suggested by dendrochronology, has critically impacted how the painting has been received, and the importance assigned to it. The fact that the National Portrait Gallery painting was painted either

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[57] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

[58] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

[59] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

[60] National Portrait Gallery, 'Mary, Queen of Scots', Published online: https://www.npg.org.uk/whatson/display/2008/mary-queen-of-scots1.

[61] National Portrait Gallery, 'Mary, Queen of Scots', Published online.

during Queen Mary's lifetime, or very shortly after, links back to notions of importance which remain firmly attached to finding the so-called 'true likenesses' of Mary Queen of Scots.

The tree ultimately used as a support for the Osborne portrait was still growing at the time of Mary Queen of Scots execution in 1587, meaning that this portrait cannot have been painted during her lifetime. A 17th century date for the panel does however raise some interesting questions about how this painting relates to the now potentially contemporary 17th century drawing by Louis Boudan and would suggest that the panel pre-dates the engravings produced by Montfaucon and Pinkerton.

However, just because the panel support may date from earlier than expected, it does not mean that the painted composition must also date from this time.

It is possible that the board could have been repurposed from a larger panel being cut down, especially as it is small scale and fairly narrow.[62]

No other panels were identified that used the same tree as this board through Tyers comparison with an extensive set of individual board data series, but this set is not exhaustive.[63]

If the hypothetical original panel was trimmed of its outer rings, this panel could have a much later date. As mentioned briefly above, the panel contains no sapwood, indicative of the outer rings of the tree, therefore, as is demonstrated in figure 29, a diagram supplied by Ian Tyres in his report, if the panel was cut down from a wider board of unspecified width, the tree rings could have continued, meaning tree may have been felled later.[64]

Tyers does however point out that if the original panel had around 30 cm of usable heartwood it would have been better employed with the grain horizontally, allowing for less wood waste, the vertical grain and small scale of the board in this case therefore implies that very little trimming took place.[65]

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[62] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.
[63] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.
[64] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.
Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.

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There is no evidence in the X-ray (Plate 9) or infrared reflectograms (Plates 8 and 11) of any prior compositions present on the panel, although it is possible that evidence of prior composition could have been obscured by interference from the materials used to create the present composition: The X-ray image is dominated by the overwhelming presence of strongly X ray absorbing material, possibly a thick lead white ground layer. Similarly, the presence of another composition could be obscured by carbon containing passages of paint in the infrared reflectograms.

To this end, Macro X-ray fluorescence (XRF) scanning was employed to produce elemental maps of the composition. these maps could help identify the use of different pigments at used for any underlying compositions, with less interference from the presence of other elements. Ultimately, none of these maps gave any indication that another composition was present under the present one.

Tyers did suggest another possibility in his report; that the panel could indeed have been repurposed, but sourced instead from a redundant bit of unpainted timber such as 17th or 18th century panelling.[66] While there is little focused literature on panel supports in the nineteenth-century, Joyce Townsend notes that "Anecdotal evidence suggests nineteenth-century [panels] vary from well-crafted, purpose-made ones to recycled rubbish", it would therefore be reasonable to conclude that this panel was an example of the latter.[67]

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[66] Tyers, I. 'Mary Queen of Scots', *Tree-ring analysis of 4 panel paintings,* Dendrochronological Consultancy Report, unpublished, February 2023 p. 11.
[67] Townsend, J. H. 'The Materials Used by British Oil Painters in the Nineteenth Century', *Tate Papers* no. 2, Published online, Autumn 2004.

Figure 28.
Unknown artist, *Mary, Queen of Scots*, c. 1560-1592, Oil on panel, 25.1 x 19.1 cm, National portrait Gallery, London.
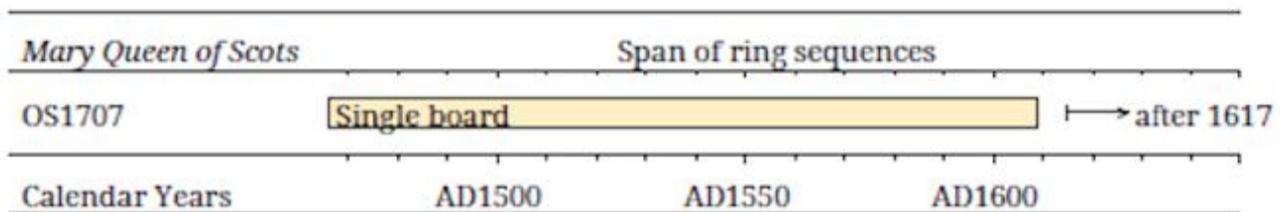

Figure 29.
Diagram supplied by Ian Tyres in his report: 'Mary Queen of Scots, attributed to British School', *Tree-ring analysis of 4 panel paintings from the Royal Collection,* Dendrochronological Consultancy Report, unpublished, February 2023, p. 12.
Diagram illustrates how a later tree ring sequences, possibly indicating a later date for the panel, may have been lost if the panel was cut down.

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Ground and Preparation

The ground used for this painting extends over all four edges of the panel suggesting it was applied after the panel had assumed its current dimensions. Robust drips of ground found on the panel verso also imply that the ground had some bulk and was applied thickly and freely.

Point analysis using XRF identified both Lead and Calcium in varying levels across the whole surface of the painting. The X radiograph (plate 9) and lead XRF scanning elemental map (Figure 30) indicate that the presence of these two elements may have been across separate preparatory layers. A lead containing, most likely lead white layer, appears to have been unevenly applied and does not extend to the edge of the composition at the top of the panel. This layer also appears to have been scraped away in several areas, most notably on the right side of the panel, in a region which extends beneath part of the chair.

It was not possible to view this layer in cross sections, as samples could not safely be taken from the areas covered by this layer without affecting the composition.

A Subsequent thick, chalk-containing layer then appears to have been applied across the composition, covering any losses to the lead white layer and extending over the edges of the panel. This is most likely the layer George Scharf was referring to in 1888 as "a priming of fine gesso, or plaster of Paris."[68]

It was possible to take a sample including this layer (see appendix V) and produce a cross section (appendix VI, sample 1) which shows that the layer primarily consisted of calcium with some silicon inclusions. This would suggest a chalk ground layer. Interestingly, the Strontium XRF scanning elemental map (Figure 31) closely corresponds to this layer seemingly filling the losses in the lead layer. A study of strontium in cultural heritage by Enrico Franceschi and Federico Locardi has suggested a promising link between the presence of strontium and the presence of gypsum or Plaster of Paris and directly supporting Scharf's conclusions.[69] Ground layers containing chalk were used throughout the 17th, 18th and 19th centuries.[70]

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[68] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 472.
[69] Franceschi E. and Locardi F. 'Strontium, a new marker of the origin of gypsum in cultural heritage?', Journal of Cultural Heritage vo. 15, published online: Elsevier Masson SAS 2014, pp. 522–527. & Ibid. Scharf, G. 1888, p. 472.
[70] Stols-Witlox, M. 'Grounds, 1400-1900' Conservation of Easel Paintings, 2nd Edn. London: Routledge, 2020, p. 182.

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The presence of a carbon containing underdrawing can be discerned through analysis of an infrared reflectogram (plates 8 & 11, appendix I) which reveal some sparse underdrawing most prevalent in the chair to the right of the sitter. Looking closely as the Osiris infrared image (plate 8, appendix I) there are faint, regular lines visible on the right-hand side of the composition, continuing across the chair (figure 32). It is possible that these could be gridlines, executed in a carbon-containing material. The presence of these lines could provide a crucial piece of evidence that the composition was copied from another source and transferred onto the panel using a grid method, supporting the notion that *The Osborne Portrait* may derive from a pre-existing source such as the Boudan drawing or a later engraving.
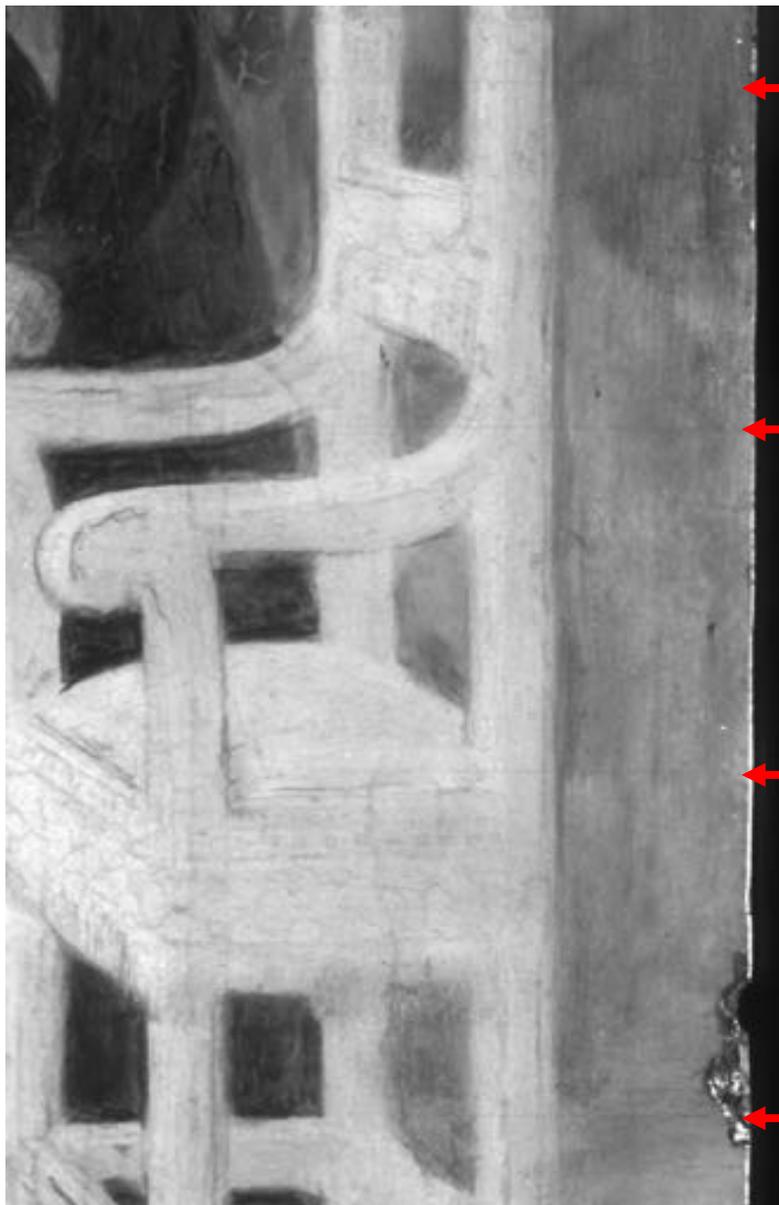

Figure 30.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Lead (Pb).

Figure 31.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Strontium (Sr).

Figure 32:
Unknown artist & date,
Mary, Queen of Scots, Oil on panel, c.30.2 x
20.4 x 0.8 cm, Royal Collection Trust:
Holyrood House Palace, Edinburgh.
Before Treatment, General View, Recto,
Infrared Reflectography. Taken with
OSIRIS IR camera.
Detail of regularly spaced gridlines,
beginning at the right edge of the
composition and continuing into the chair.
Gridlines lines have been indicated by red
arrows for clarity.

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Paint Layers

Point analysis using X-ray Fluorescence Spectroscopy (XRF) indicates that many traditional pigments were used to produce this painting. There is, however, the critical inclusion of a significant number of pigments introduced in the 19th century, which stand to reinforce the original date assigned to this painting based on stylistic grounds, and its attribution history.

Green

Through XRF analysis and macro XRF elemental mapping (see figures 33 and 34), the "plain, rich, brown-green tint" as Scharf describes the background, was found to contain both copper and arsenic.[71] Copper and arsenic are the key chemical components of both Scheele's Green ($CuHAsO_3$) and Emerald Green ($3\ Cu(AsO_2)_2 \cdot Cu(CH_3COO)_2$).[72] Scheele's Green is a dull green acid copper arsenite discovered in 1775 by the Swedish chemist Carl Wilhelm Scheele, which was to be rapidly superseded by the brighter Emerald Green, a copper aceto-arsenite first produced commercially by Friedrich Russ and Wilhelm Sattler in Schweinfurt in 1814 and used widely from the 1820s onwards.[73]

Analysis of a cross section produced from a sample of the background (appendix VI, Sample 1) reveals the presence of multiple, round, blue-green pigment particles (figure 35) characteristic of Emerald Green.[74] Further analysis using Scanning Electron Microscopy with energy dispersive X-ray spectroscopy (SEM-EDX) further confirmed that these particles were made up of copper and arsenic, allowing for their almost certain positive identification.

In the cross section of sample 1, while the paint still appears as one fairly homogenous layer, it seems to become browner just beneath the varnish (appendix VI, Sample 1, layer 3). This phenomenon could also be linked to the presence of Emerald Green, which can degrade in

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[71] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 472.
[72] Gettens, R. J. and Stout G. L. *Painting Materials: A Short Encyclopedia,* New York: Dover Publications*,* 1966, pp. 113 and 154. & Fielder, I. & Bayard, M. A. 'Emerald Green and Scheele's Green', in Fitzhugh, E. W. (Ed.), *Artists' Pigments A handbook of their history and characteristics*, Vol. 3, Washington: Oxford University Press, National Gallery of Art, 2007, p. 223.
[73] Carlyle, L. 'Appendix 26, pigments and colours described or mentioned in the sources', *The artist's assistant oil painting instruction manuals and handbooks in Britain, 1800-1900, with reference to selected eighteenth-century sources,* London: Archetype Publications 2002, p. 493. & Gettens, R. J. and Stout G. L. *Painting Materials: A Short Encyclopedia,* New York*:* 1966, pp. 113 and 154-155. & Fielder, I. and Bayard, M. A. 'Emerald Green and Scheele's Green', Artists' Pigments, Washington: 2007, p. 223.
[74] Gettens, R. J. and Stout G. L. *Painting Materials: A Short Encyclopedia,* New York*:* 1966, pp. 113

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medium rich paint films to form a transparent brown layer, especially in the presence of iron and aluminium which are also present in this sample.[75]

While the background appears to have been applied near the end of the painting process, it was painted before the white details in the collar or ostrich feather hat (figure 36) which has been applied over the background. The Cross section of Sample 1, (appendix VI) further indicates that the background was applied as a single layer directly over the ground, meaning that it is highly unlikely that this paint was added at a later date, so this painting was almost certainly from the 19th century, painted at some point between 1814, when Emerald Green was introduced and the painting's acquisition by Prince Albert in 1845.

It is possible that green earth ($K[(Al,Fe^{3+}),(Fe^{2+},Mg)](AlSi_3,Si_4)O_{10}(OH)_2$) was also used given the identification of Iron, potassium, magnesium aluminium and silicon through SEM-EDX analysis. Green earth was another pigment used throughout the 19th century.[76]

The chromium XRF scanning elemental map (figure 37) suggests the presence of some chromium containing pigment. chrome green was first advertised as 'Oxide of Chromium' by Winsor and Newton in their c. 1840 catalogue and chrome yellow ($PbCrO_4$) was referenced in 1835 by the colourman George Field (1777-1854).[77]

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[75] Keune, K. Mass, J. Mehta, A. Church, J. & Meirer, F. 'Analytical Imaging Studies of the Migration of Degraded Orpiment, Realgar, and Emerald Green Pigments in Historic Paintings and Related Conservation Issues', *Hertiage Science,* London: SpringerOpen, 2016, pp. 2-3. & Keune, K. Boon, J. J. Boitelle, R. & Shimadzu Y. 'Degradation of Emerald Green in Oil Paint and its Contribution to the Rapid Change in Colour of the *Descente des Vaches* (1834-1835) Painted by Théodore Rousseau' *Studies in Conservation*, Vol. 58, No. 3. Leeds: Maney Publishing, 2013, p. 199.

[76] Carlyle, L. 'Appendix 26, pigments and colours described or mentioned in the sources', *The artist's assistant oil painting instruction manuals,* London: 2002, p. 496.

[77] Carlyle, L. 'Appendix 26, pigments and colours described or mentioned in the sources', *The artist's assistant oil painting instruction manuals,* London: 2002 pp. 492 & 521.
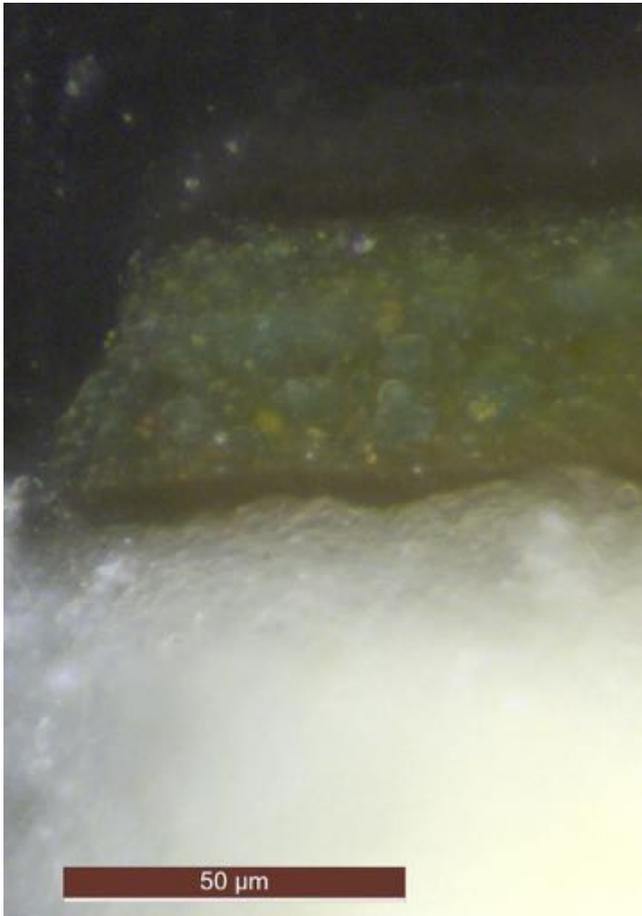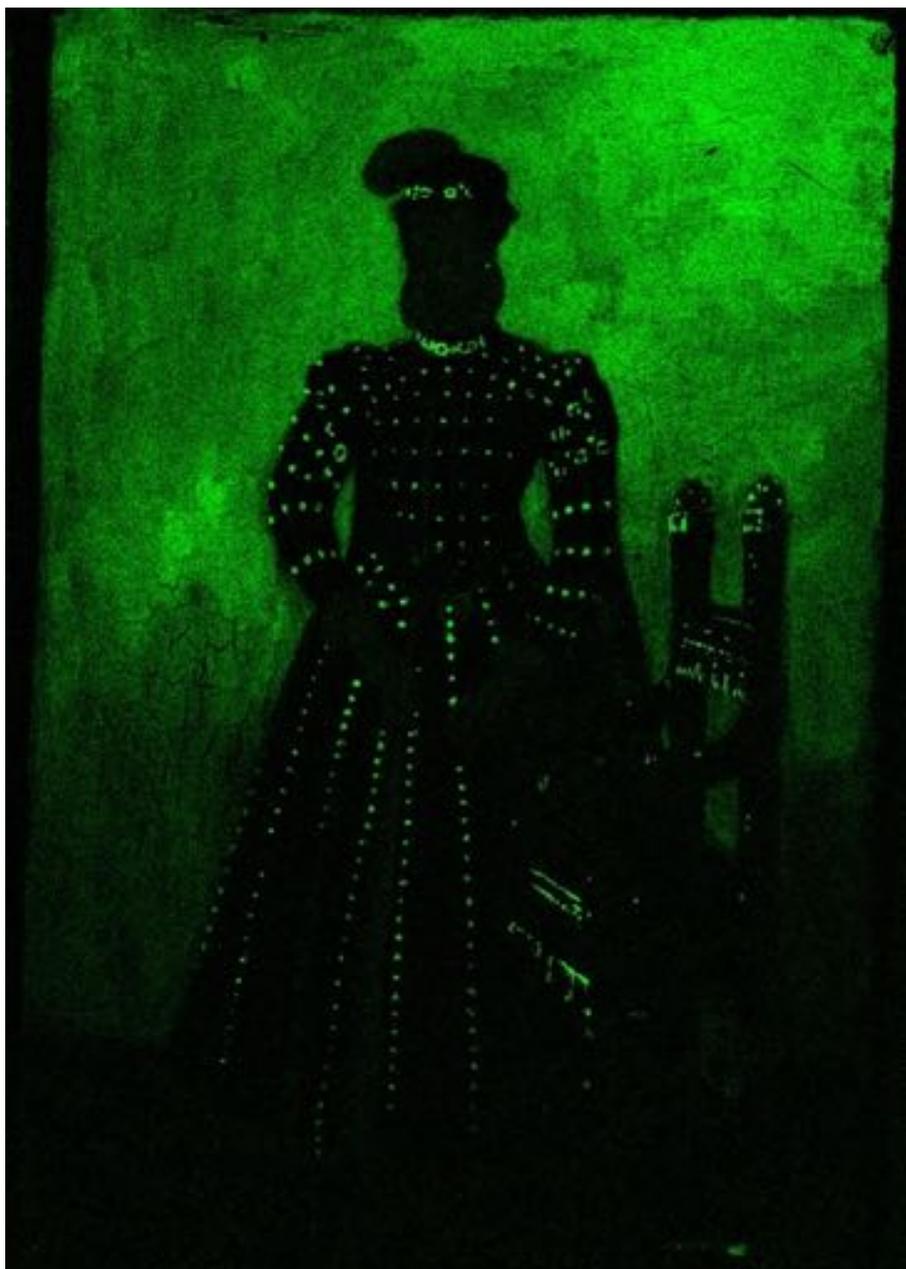
Figure 33.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Copper (Cu).

Figure 34.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Arsenic (As).

Figure 35.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail, Normal Light, 50 um, Cross section produced from Sample 1, revealing the presence of rounded, blue-green, emerald green pigment particles. (See appendices V and VI)

Figure 36.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of the hat feather, white highlights appear transparent and thinly applied.

Figure 37.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Chromium (Cr).

Yellow

Along with chromium, barium and iron (figures 38 and 39) are identified in the rows of gold-coloured studs adorning the dress, and the yellow details of the chair. Barium and chromium were the principal components of Lemon Yellow ($BaCrO_4$) first mentioned by Field in 1835.[78] The barium and chromium maps do not directly overlap (figures 38 and 37), meaning that it is unlikely that lemon yellow was used for all these details, possibly being confined to the studs adorning the dress if it was used at all. Iron on the other hand, is the main component of yellow ochre, and its map shares much more of an overlap with the barium map (figures 39 and 38). According to additives found in an examination of the tube paints used by the 19th century artist James McNeill Whistler (1834-1903) yellow ochre was sometimes adulterated through the addition of barium sulphate, which could be one possible explanation for the overlapping presence of iron and barium.[79] If these pigments are present, they would date the painting to an even later point, between 1830 and 1845, and would suggest that the artist was engaging with the very latest, modern pigments.

It is also interesting to note how the range of yellow pigments appear to have been used. Yellow ochre appears to have been utilised more widely to create the darker and mid yellow tones before chrome yellow, potentially lemon yellow and lead white were employed in various quantities to pick out the lighter details on the chair, as can be seen in figure 40, and for the jewellery and gold studs of the costume.

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[78] Otero, V. Campos, M. F. Pinto, J. V. Vilarigues, M, Carlyle, L & João Melo, M. 'Barium, Zinc and Strontium Yellows in Late 19th-Early 20th Century Oil Paintings', *Heritage Science,* London: SpringerOpen, 2017, p. 1. & Carlyle, L. 'Appendix 26, pigments and colours described or mentioned in the sources', *The artist's assistant oil painting instruction manuals,* London: 2002, p. 521.

[79] Townsend, J. H. Carlyle, L. Khandekar, N. & Woodcock, S. 'Later nineteenth Century Pigments: Evidence for Additions and Substitutions', *The Conservator*, No. 19, London: United Kingdom Institute for Conservation of Historic and Artistic Works, 1995, p 73.

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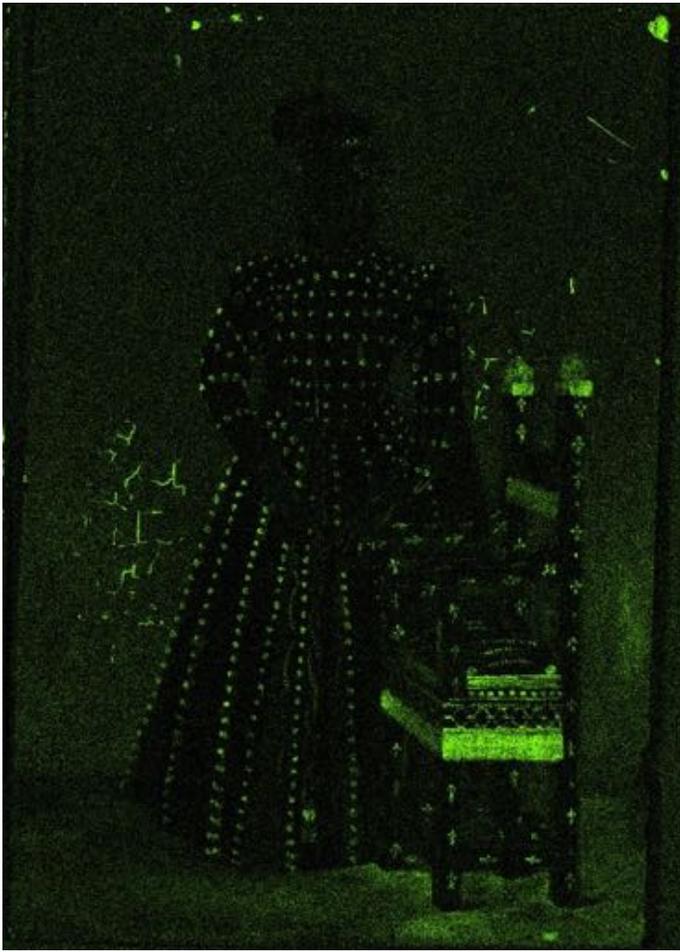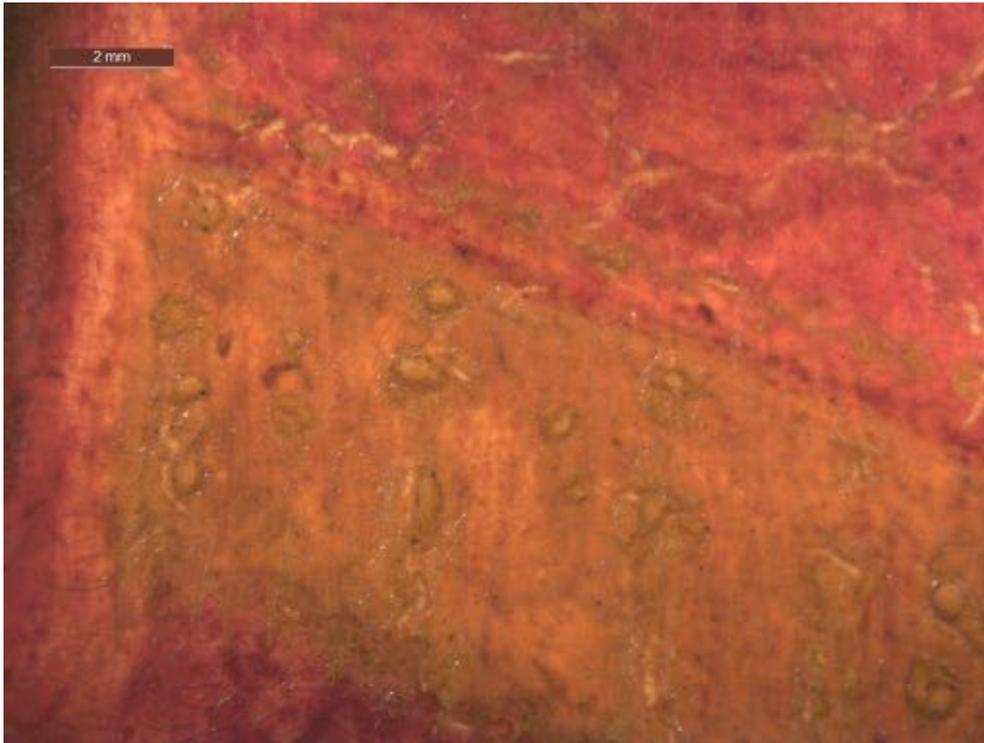

Figure 38.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Barium (Ba).

Figure 39.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Iron (Fe).

Figure 40.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x
0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After
Treatment.
Micrograph detail of the yellow fringe adorning the red chair. Showing the
different yellow paints used.

Additional Colours

Different pigments were also used to achieve the different red tones of the chair, with some iron red pigments, alongside vermillion (HgS) identified in the mercury map (figure 41) to pick out the more vibrant tones. Vermillion was similarly employed for the sitter's red lips (figure 42) and the red jewels adorning her costume (figure 43.

The black fabric of the dress appears to have been rendered with high levels of calcium (figure 44) suggesting the black pigment utilised was bone or Ivory black which was common for a 19th century palette.[80]
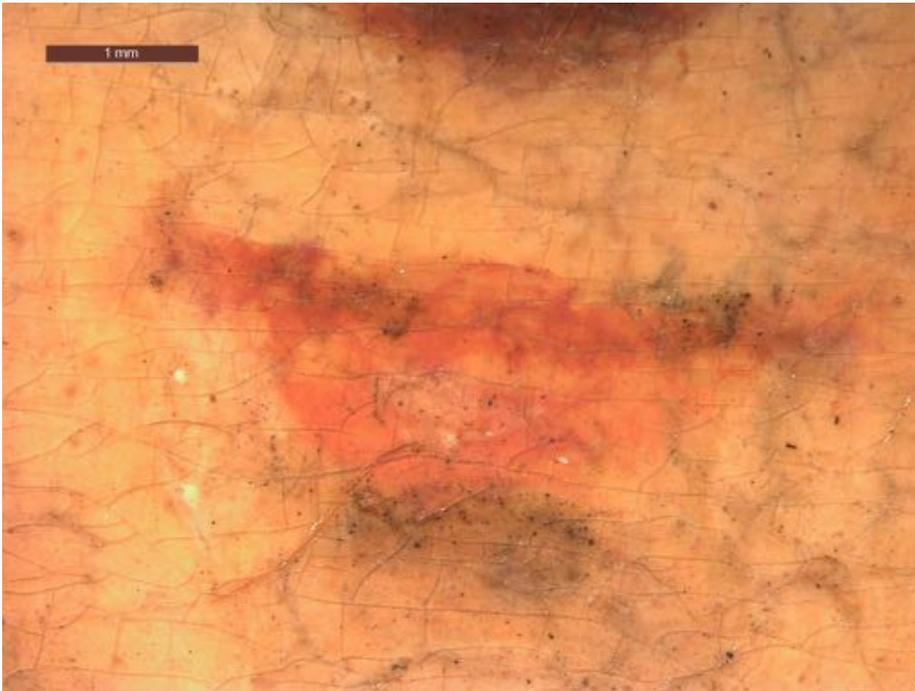

Figure 41.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Mercury (Hg).

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[80] Carlyle, L. 'Appendix 26, pigments and colours described or mentioned in the sources', *The artist's assistant oil painting instruction manuals,* London: 2002, pp. 467-8.

Figure 42.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment.
Micrograph detail of the sitters lips, thinly applied in a transparent glaze containing vermillion.
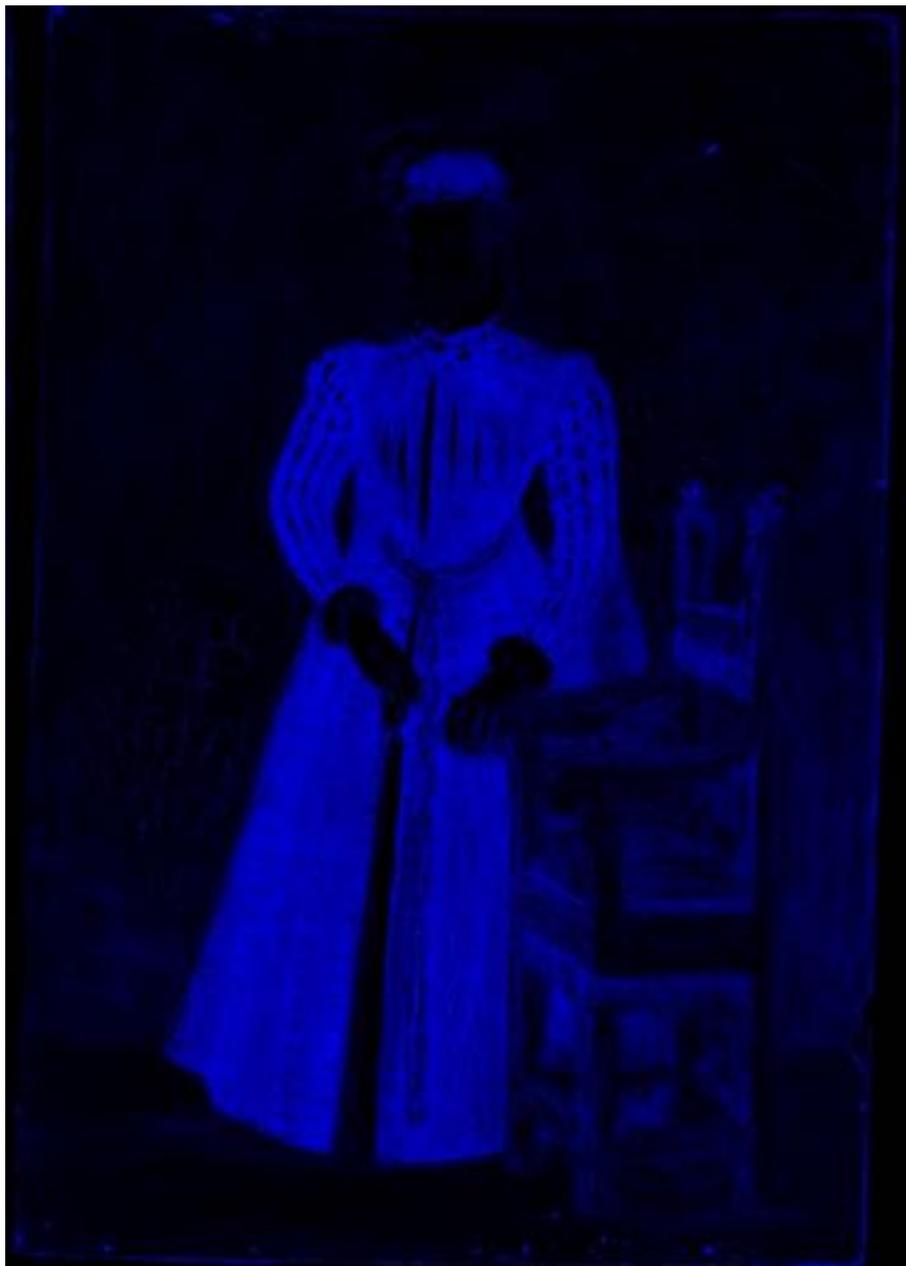

Figure 43.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment.
Micrograph detail of a red jewel in the hatband, displaying rich tones utilizing vermillion pigment have been built up in multiple transparent layers.

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Figure 44.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal
Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Calcium (Ca).

Technique

In terms of application, the paint layers have in general been very thinly applied, utilising semi-transparent glazes rich in binding media applied either directly onto the ground, or above more opaque passages of paint to create richer effects with more depth and luminosity. The technique is especially evident in the jewels of the costume when viewed under the microscope, as can be seen in figure 43 where the cherry red transparent layer, possibly using vermillion, seems to have been added above a more opaque, orange-toned layer, and then finished with semi-transparent white highlights.

This kind of glazing technique has been commonly used in oil painting since the technique was first developed by early Flemish painters, and popularised by Van Eyck.[81] The technique continued to be a popular technique well into the 19th century where it was taken up for famously by the Pre-Raphaelite painters who frequently employed natural resin-based additives such as Roberson's copal-based mediums or megilp to aid with the technique and impart the desired handling and optical qualities to their paints.[82] Driers were similarly employed, to alter the handling of the paint.[83] Experimenting with mediums and driers could however result in issues such as drying cracks which are present in this painting, most notably to the left of the sitter (figure 45).[84] These cracks were remarked upon as early as 1888, with George Scharf noting that part of the background to the left of the figure, over the knob of the chair was cracked so as to show the "white ground of gesso" (figure 46).[85]

In an attempt to investigate the composition of the binding media used to create *Mary Queen of Scots,* a sample was taken from the painting from Sample Site 2. (see sample site map, appendix V) The sample was analysed using Fourier-Transform Infrared Spectroscopy (FTIR) in transmission mode to generate the spectra seen in figure 47.

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[81] Viguerie, L. Ducouret, G. Cotte, M. Lequeux, F. and Walter, P. 'New Insights on the glaze technique through reconstruction of old glaze medium formulations', *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, Vol. 331, published online: Elsevier Masson SAS, Issues 1–2, 2008, p. 119.

[82] Townsend, J. H. Carlyle, L. Khandekar, N. & Woodcock, S. 'Later nineteenth Century Pigments: Evidence for Additions and Substitutions', *The Conservator*, No. 19, London: United Kingdom Institute for Conservation of Historic and Artistic Works, 1995, pp.47-49 & 65-67.

[83] Carlyle, L. 'Paint Driers Discussed in 19th-Century British Oil Painting Manuals', Journal of the American Institute for Conservation, Vol. 38, No. 1, Oxford: Taylor & Francis, 1999, p. 73.

[84] Carlyle, L. 'Paint Driers Discussed in 19th-Century British Oil Painting Manuals', Journal of the American Institute for Conservation, Oxford: 1999, p. 73.

[85] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 473.

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The spectra generated imply the presence of a natural resin in the sample, given their similarity to reference spectra generated by other natural resin varnishes including copal and mastic (figures 48 & 49) with a similar spectra shape based on their IR absorption band regions.[86] The spectra generated by tree resins such as mastic and copal feature peaks in the Carbonyl band region with wavenumbers of 1690-1715 cm^{-1}.[87] Tree resins also produce spectra with strong C-H stretching vibrations generally found between 2958-2930 and 2875-2865cm^{-1}, peaks close to those produced by this sample.[88] It is however difficult to differentiate between similar components in a complex sample using FTIR alone. In addition, as will be addressed in the following section, a natural resin was also most likely used to varnish the painting, so the spectra generated by this sample could be reflecting the varnish and not necessarily an additive in the paint.

As a result, it is not currently possible to determine whether any of these mediums have been used or not without carrying out additional organic analysis, such as using Gas Chromatography and mass spectrometry.

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[86] Derrick, M. R. Stulik, D. & Landry, J. M. *Infrared Spectroscopy in Conservation Science: Scientific tools for conservation*, Los Angeles: The Getty Conservation Institute, 1999, pp. 103-107.

[87] Derrick, M. R. Stulik, D. & Landry, J. M. *Infrared Spectroscopy in Conservation Science,* Los Angeles: 1999, pp. 103-107.

[88] Derrick, M. R. Stulik, D. & Landry, J. M. *Infrared Spectroscopy in Conservation Science,* Los Angeles: 1999, pp. 103-107.
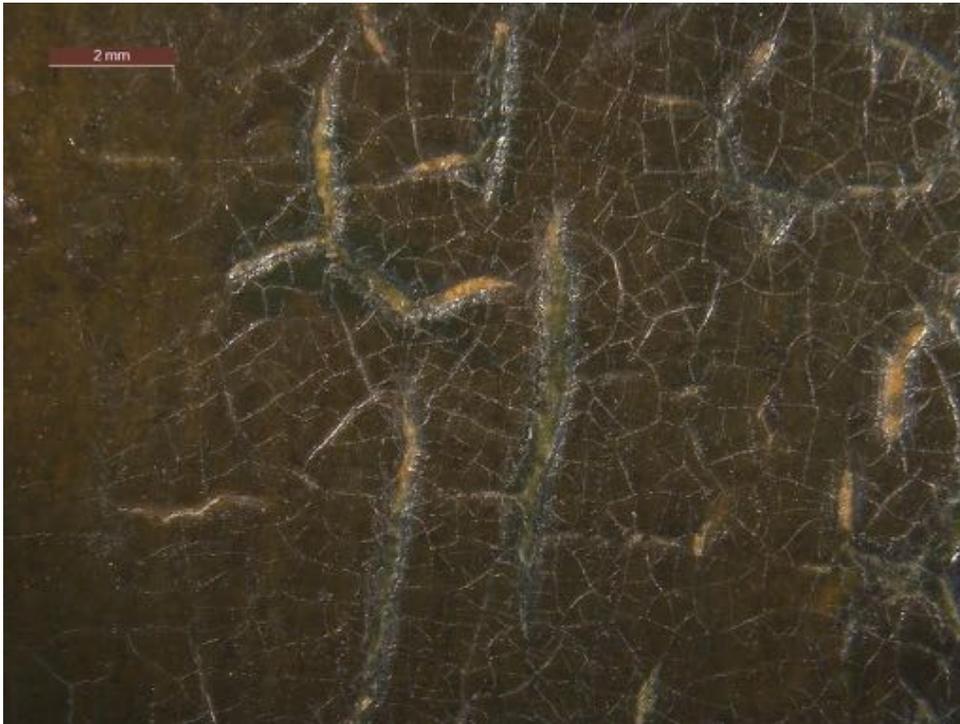
Figure 45.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of drying cracks locally retouched with a green paint that does not match the original.
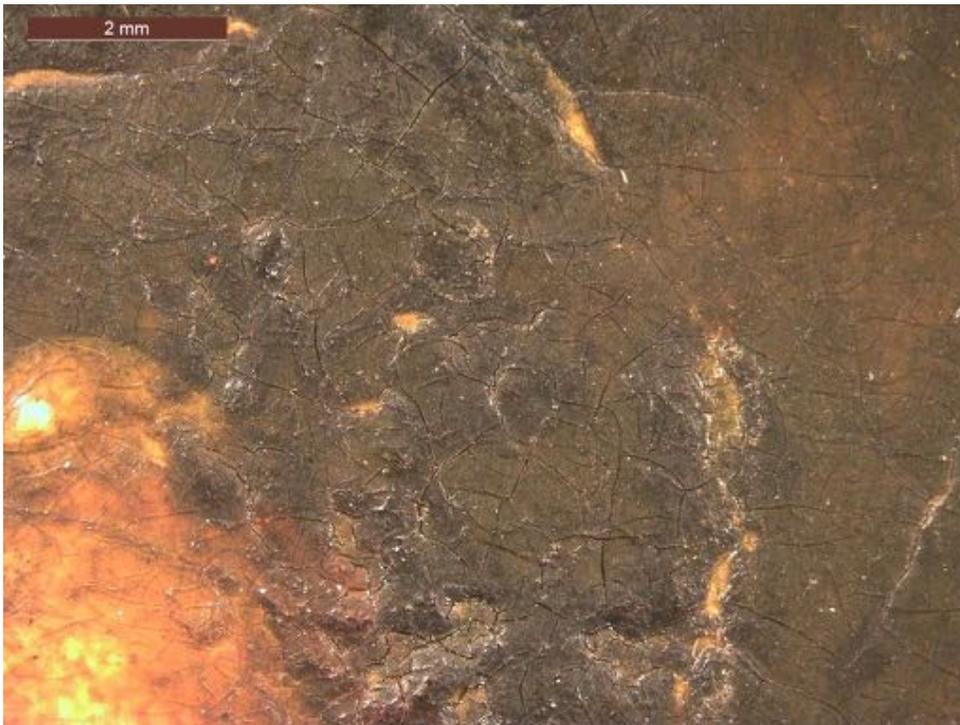

Figure 46.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of drying cracks located above the back of the chair.

Figure 47.
Spectrum generated using FTIR transmission to analyze a sample taken from sample site 2 (appendix V).

Figure 48.
Copal resin reference spectrum from the IRUG Spectral Database.

Figure 49.
Mastic resin reference spectrum from the IRUG Spectral Database.

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Surface Coatings

When examined under exposure to ultraviolet light (plate 7, appendix I) the surface fluoresces a strong green colour which is indicative of an aged natural resin varnish. The layer has crazed (figure 50) leading to an extensive pattern of fine craquelure which is visually disruptive to the image and masks several fine details of the composition.

The gold XRF scanning elemental map (figure 51) reveals some areas where gold appears to have been transferred, possibly from a gilded frame to the surface of the painting, which is also identifiable under the microscope (figure 52). similarly, the white material present to the bottom right of the painting is shown to contain zinc in the elemental map (figure 53).
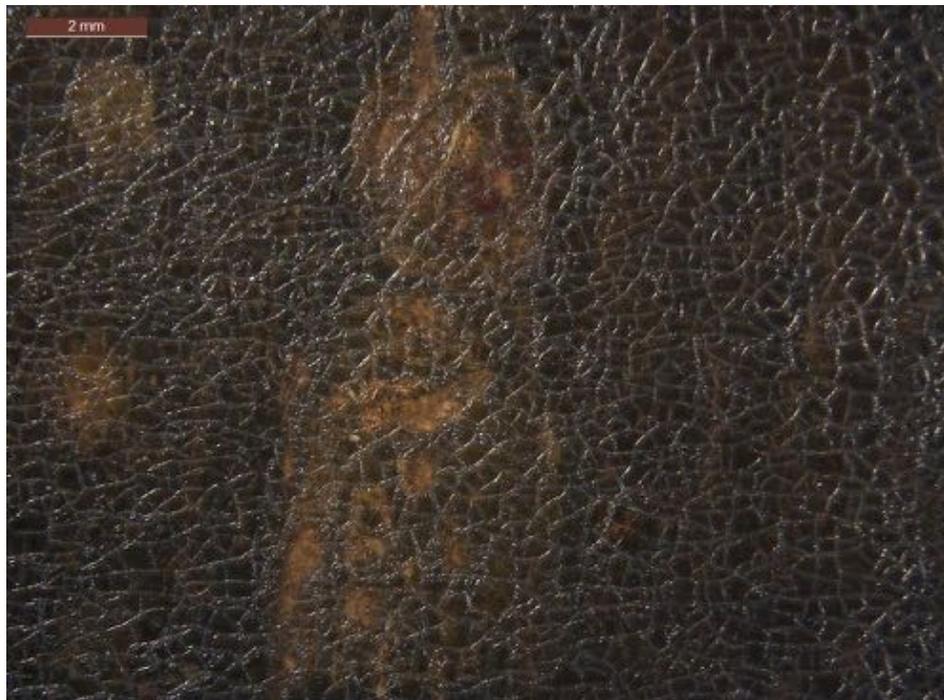

Figure 50.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment.
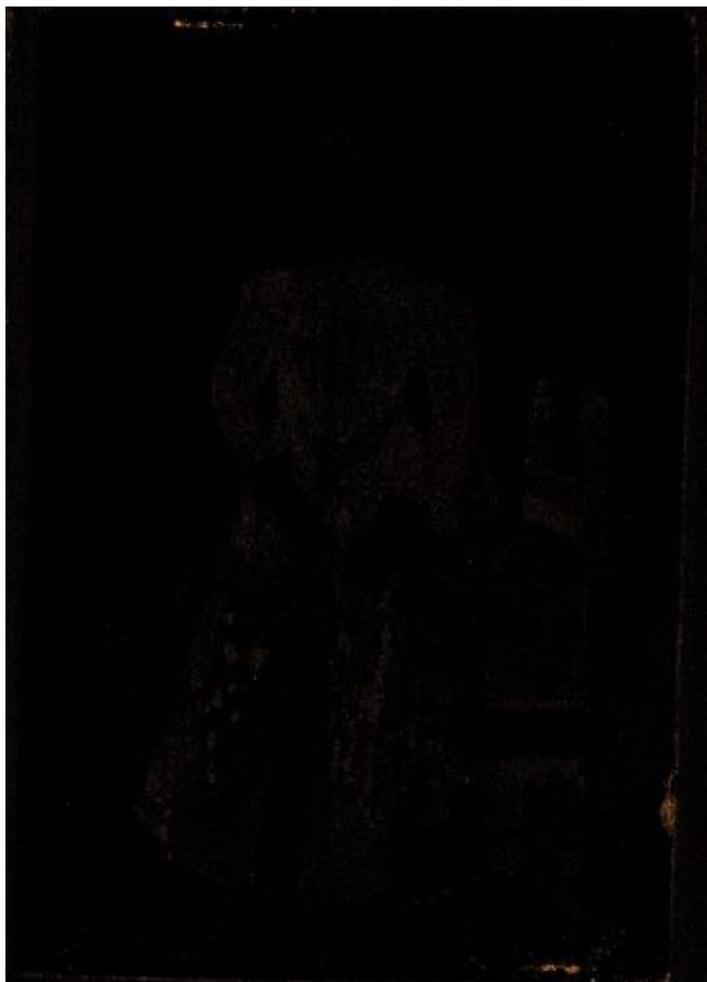Micrograph detail of the tassel and crazed varnish, obscuring the composition beneath.

Figure 51.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Gold (Au).

Figure 52.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment.
Micrograph detail of the bottom right of the painting where gold, possibly from a frame is visible.

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Figure 53.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal
Collection Trust: Holyrood House Palace, Edinburgh.
MA XRF elemental map: Zinc (Zn).

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Evidence of Previous Conservation Treatments

Traces of Titanium and Zinc were identified using XRF. The zinc component is clearly visible in the scanning map (figure 53) indicative of the modern retouching which has been applied over drying cracks, as can be seen in figure 45, most likely in an attempt to tone them to the surrounding background.

Owing to the use of modern pigments, and Scharf's 1888 comments that the cracks allowed him to see the "white ground beneath", this toning must have been done at a later point in the painting's history, although it is not known exactly when.[89]

Scharf additionally noted that "the tip of the nose has been slightly injured" which appears to have been rectified at an unspecified later date (figure 54).[90]

The cleaning tests mentioned in the condition report (figure 55) were conducted by Nichola Christie, Head of Paintings Conservation at the Royal Collection.[91]

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[89] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888, p. 473.
[90] Scharf, G. 'A brief account of a Small Portrait of Mary Queen of Scots', *Archaeologia,* London: 1888,, p. 473.
[91] information supplied via personal correspondence with *Nicola Christie,* Head of Paintings Conservation at the Royal Collection. December-January 2023-2024.
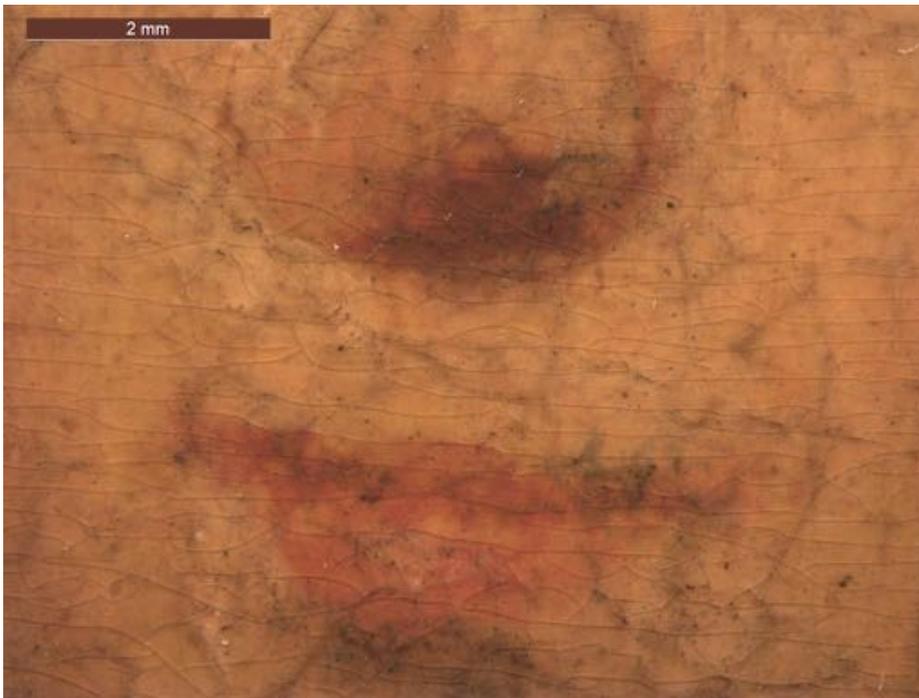
Figure 54.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment.
Micrograph detail of the nose, which has been retouched following a loss noted in 1888 by George Scharf.

Figure 55.
Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment.
Micrograph detail of a cleaning test performed by Nichola Christie, Head of Paintings Conservation at the Royal Collection.

The Courtauld

Conclusions of Technical Analysis

While dendrochronological analysis assigned a *terminus post quem* or earliest possible date of 1617 for the panel support, inorganic analysis of pigments indicates that the *Osborne Portrait* was most likely completed in the 19th century, sometime between 1830-1845.

This means that the painting was indeed completed later than the Boudan Drawing, and the subsequent engravings made by Montfaucon and Pinkerton.

The presence of gridlines made visible through inferred analysis further suggest that the composition could have been copied from another source, which when taken with the visual and contextual evidence hitherto discussed, support the notion proffered that *The Osborne Portrait* likely derives from a printed engraving made after the Boudan drawing.

Conclusions

Our research investigated the relationship between a 19th-century portrait and a 17th-century Louis Boudan drawing, focusing on the materials and techniques used in the painting to determine its origin and influence. A prior dendrochronological analysis revealed that the wooden support used for the portrait dates to the 17th-century, challenging previous beliefs that the painting was from the Victorian era. The presence of Emerald Green and other pigments dating from the early 19th century supports the conclusion that the painting was created sometime between 1830 and 1845. Additionally, the detection of gridlines in the infrared image suggests that the composition may have been copied from another source. Despite the earlier date of the panel then, *The Osborne Portrait's* materials can be dated to the nineteenth century, which postdates the Boudan drawing.

We agree with Victorian critics, curators, and living Marian specialists who have previously concluded that *The Osborne portrait* of Mary, Queen of Scots derived from Boudan's drawing, albeit with multiple intermediary points of transmission from eighteenth and nineteenth century prints.

Further technical analysis and historical context could contribute to furthering our understanding of this artwork's provenance and significance. As the portrait leaves the Courtauld Institute of Art and returns to the Palace of Holyroodhouse, we are grateful to have been given this opportunity to research such a fascinating portrait of Mary Queen of Scots, derived from the rising interest in antiquarianism and royal portraiture during eighteenth and nineteenth centuries.

List of Illustrations

Condition Report and Surface Cleaning

Figure 1. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail of surface dirt and accretions forming tidelines where something has dripped onto the painting.

Figure 2. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail of white material stuck to the surface of the painting near the bottom edge.

Figure 3. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Photograph taken in normal light during treatment to show the contrast between cleaned and uncleaned sections of the painting.

Figure 4. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Photograph taken in ultraviolet light during treatment to show the contrast between cleaned and uncleaned sections of the painting.

Art Historical Analysis

Figure 5. François Clouet, *Marie Stuart,* 1552, , 28 x 20.5 cm, coloured chalk on paper, Musée Condé, Château de Chantilly, Inventory Number: MN 38.

Figure 6. François Clouet, *Marie Stuart Reine d'Ecosse en deuil blanc*, c.1561, 28 x 18.4 cm, coloured chalk on paper, Bibliothèque Nationale, Paris. Accession Number RESERVE NA-22 (17)-BOITE (Planche 4).

Figure 7. By or After Rowland Locke, *Mary, Queen of Scots*, c. 1578, oil on panel, 193.5 by 112 cm, Hardwick Hall, Inventory Number: NT 1129104.

Figure 8. William and Cornelius Cure, *Tomb of Mary, Queen of Scots*, Rance marble, white marble, touchstone, and gilding, Westminster Abbey.

Figure 9. Nicholas Hilliard, *Mary, Queen of Scots*. c.1592. Watercolour on vellum, 4.4 by 3.8 cm, Royal Collection Trust, Inventory Number: RCIN 420641.

Figure 10. Daniel Mytens (c. 1590 - 1647) after Nicholas Hilliard (1547-1619), *Mary, Queen of Scots*, c. 1627, oil on canvas, 214.2 x 125.7 cm (support, canvas/panel/stretcher external), Royal Collection Trust, Inventory Number: RCIN 401182.

Figure 11. Unknown Artist, *Mary, Queen of Scots* ['The Blairs Memorial Portrait'], c. 1600, oil on canvas, 227 x 139 cm, Blairs Museum, Accession Number: T9103BLRBM.

Figure 12. Bernard Lens, *Portrait, Supposedly of Mary Queen of Scots*, early 18th century, watercolour on ivory, 52 x 74 mm, Victoria & Albert Museum, Accession Number: P.62-1987.

Figure 13. Unknown Artist [formerly attributed to F. Zucchero], Mary, Queen of Scots, 18th century (made) [pseudo 16th century], oil on copper, Diameter: 2.625 in the Victoria & Albert Museum, Accession Number: P.26-1942.

Figure 14. George Vertue (1684 - 1756) after Daniel Mytens (about 1590 - about 1647), Mary, Queen of Scots, 1542 - 1587. Reigned 1542 - 1567, 1729, line engraving on paper, 15.88 x 8.89 cm, Scottish National Portrait Gallery, Accession number: SP I 23.8.

Figure 15. Unknown Artist (after Daniel Mytens, about 1590 - about 1647), *Mary, Queen of Scots, 1542 - 1587. Reigned 1542 - 1567*, c. 18th century, line engraving on paper, 9.22 x 7.95 cm, Scottish National Portrait Gallery, Accession number: SP I 23.116.

Figure 16. Unknown Artist, *Unknown Woman, Formerly Known as Mary Queen of Scots* [purchased in 1860 as *Mary, Queen of Scots*], c. 1570, oil on panel, transferred to canvas, 96.2 cm x 70.2 cm, National Portrait Gallery. Catalogue Number: NPG 96.

Figure 17. Bernard de Montfaucon, *Les Monumens de la monarchie francoise, qui comprennent l'histoire de France; tome cinquiéme,* pl. xiv, 1733, 44.0 x 6.5 cm (book measurement), Institut national d'histoire de l'art, Inventory Number: NUM FOL G 14 (5).

Figure 18. Bernard de Montfaucon, Les Monumens de la monarchie françoise, vol. 5, Julien-Michel. Gandouin and Pierre-François Giffart: Paris, 1733, Bibliothèque nationale de france, Inventory Number: FOL-LJ1-28 (5).

Figure 19. John Pinkerton,"Mary, from Montfaucon*"*, in *Iconographia Scotica: or Portraits of Illustrious Persons of Scotland Engraved from the most Authentic Paintings &c. With Short biographical notices*, Printed for Isaac Herbert, London: 1797.

Figure 20. Louis Boudan, *Reine de France. Marie Stuart. Reine d'Ecosse: femme du Roy François II. Marie en 1558*, gouache on parchment, 48.5x 32 cm (parchment), and 25.5 x18 cm (image) Bibliothèque National de France, Inventory Number: RESERVE OA-17-FOL (Folio : 4).

Figure 21. Unknown artist, *Marie Stuart, femme de François 2, Roi de France*, 19th century, watercolour and gouache on paper, 17.4 cm x 24 cm, Bibliothèque municipal de Rouen.

Figure 22. Unknown Artist, *Marie Stuart, Queen of France and Scotland*. Illustration drawn and lithographed by Madame Calon after a portrait in Roger de Gaignieres' gallery portfolio IX 4 from Le Bibliophile Jacob aka Paul Lacroix's Costumes Historiques de la France (Historical Costumes of France), Administration de Librairie, Paris, 1852.

Figure 23. F. Roy, "Marie Stuart", engraving, in La France et les Français à Travers les Siècles, Vol. 3, by Augustin Challamel, Paris: 1884, pl. 51.

Figure 24. Marie Préval, Printed by Gilquin in Paris, "History of Fashion", in *The History of Fashion in France, or The dress of women from the Gallo-Roman period to the Present Time* by Augustin Challamel, translated from French to English by Mrs. Cashel Hoey and Mr. John Lillie, Published by Scribner and Welford, New York, printed by Gilbert and Rivington Limited, London: 1882, p. 81.

Figure 25. Adolphe Pierre Riffaut, Marie Stuart, in *Portraits des personnages français les plus illustres du XVIe siècle, reproduits, en fac-similé, sur les originaux dessinés aux crayons de couleur par divers artistes contemporains, recueil publié avec notices par P. G. J. Niel. Première série : Rois et reines de France, Maîtresses des rois de France,*

P.G. J. Niel, ed., Paris: 1848, Bibliothèque de l'Institut National d'Histoire de l'Art, Inventory Number: NUM FOL L 219 (1).

Figure 26. Paul and Dominic Conalghi, "Mary, Queen of Scots," in *Séries of photographs from Portraits of Mary Queen of Scots, executed by Caldesi and Montecchi, from the collection exhibited by Archaeological Institute. June. 1857. Paul and Dominic Colnaghi, London. 1858, p*hotograph in 38 cm x 27.6 cm,1858, Musée Conde, Château de Chantilly. Inventory Number PH No 109.

Figure 27. Unknown Artist, *Marie Stuart*, oil on panel, 66.5 x 40 cm, before 1910, Inverness Museum and Art Gallery. Accession Number: INVMG 0000.368.

Technical analysis: Materials and Techniques

Figure 28. Unknown artist, *Mary, Queen of Scots*, c. 1560-1592, Oil on panel, 25.1 x 19.1 cm, National portrait Gallery, London.

Figure 29. Diagram supplied by Ian Tyres in his report: 'Mary Queen of Scots, attributed to British School', *Tree-ring analysis of 4 panel paintings from the Royal Collection,* Dendrochronological Consultancy Report, unpublished, February 2023, p. 12. Diagram illustrates how a later tree ring sequences, possibly indicating a later date for the panel, may have been lost if the panel was cut down.

Figure 30. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Lead (Pb).

Figure 31. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Strontium (Sr).

Figure 32. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment, General View, Recto, Infrared Reflectography. Taken with OSIRIS IR camera. Detail of regularly spaced gridlines, beginning at the right edge of the composition and continuing into the chair. Gridlines lines have been indicated by red arrows for clarity.

Figure 33. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Copper (Cu).

Figure 34. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Arsenic (As).

Figure 35. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment.

Micrograph detail, Normal Light, 50 um, Cross section produced from Sample 1, revealing the presence of rounded, blue-green, emerald green pigment particles. (See appendices V and VI)

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Figure 36. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment.

Micrograph detail of the hat feather, white highlights appear transparent and thinly applied.

Figure 37. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Chromium (Cr).

Figure 38. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Barium (Ba).

Figure 39. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Iron (Fe).

Figure 40. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of the yellow fringe adorning the red chair. Showing the different yellow paints used.

Figure 41. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Mercury (Hg).

Figure 42. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of the sitters lips, thinly applied in a transparent glaze containing vermillion.

Figure 43. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of a red jewel in the hatband, displaying rich tones utilizing vermillion pigment have been built up in multiple transparent layers.

Figure 44. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Calcium (Ca).

Figure 45. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of drying cracks locally retouched with a green paint that does not match the original.

Figure 46. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of drying cracks located above the back of the chair.

Figure 47. Spectrum generated using FTIR transmission to analyze a sample taken from sample site 2 (appendix V).

Figure 48. Copal resin reference spectrum from the IRUG Spectral Database.

Figure 49. Mastic resin reference spectrum from the IRUG Spectral Database.

Figure 50. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. After Treatment. Micrograph detail of the tassel and crazed varnish, obscuring the composition beneath.

Figure 51. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Gold (Au).

Figure 52. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 cm x 20.4 cm x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail of the bottom right of the painting where gold, possibly from a frame is visible.

Figure 53. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. MA XRF elemental map: Zinc (Zn).

Figure 54. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail of the nose, which has been retouched following a loss noted in 1888 by George Scharf.

Figure 55. Unknown artist & date, *Mary, Queen of Scots*, Oil on panel, c.30.2 x 20.4 x 0.8 cm, Royal Collection Trust: Holyrood House Palace, Edinburgh. Before Treatment. Micrograph detail of a cleaning test performed by Nichola Christie, Head of Paintings Conservation at the Royal Collection.

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Appendices

Appendix I: Technical Images

Plate 1: Before Treatment, General View, Recto, Ordinary Light.

Plate 2: Before Treatment, General View, Verso, Ordinary Light.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 3: Before Treatment, General View, Recto, Raking Light from Left Edge.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 4: Before Treatment, General View, Recto, Raking Light from Right Edge.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 5: Before Treatment, General View, Recto, Raking Light from Top Edge.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 6: Before Treatment, General View, Recto, Raking Light from Bottom Edge.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 7: Before Treatment, General View, Recto, Ultraviolet Fluorescence.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 8: Before Treatment, General View, Recto, Infrared Reflectography. Taken with OSIRIS IR camera.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 9: Before Treatment, General View, Recto, X Radiograph.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 10: After Treatment, General View, Recto, Ordinary Light.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Plate 11: After Treatment, General View, Recto, Infrared Reflectography. Taken with adapted Canon 600D Camera.

Appendix II: Analytical techniques and Instrument Specifications

Dendrochronology is a technique for dating wooden material, through the analysis and measurement tree rings present. As a tree grows, fluctuations in the climate every year result in a specific pattern of different tree-ring widths which can be measured and analysed against a library of reference data. Through this comparison the timber can then be both located and dated. This support for this painting was examined by Ian Tyres and a report produced in February 2023 which was supplied for the present study by the Royal Collection Trust.

Technical Photography was carried out in the Courtauld Institute of Art Photography Studio using a Canon 600D Camera with an 18-55mm lens. Raking light photographs were set up using halogen lights. Photographs were corrected for light balance using Adobe Photoshop.

Optical Microscopy is a technique used to examine the surface of paintings.

Optical Microscopy was carried out at the Courtauld Institute of Art using a Leica DM4000 M LED optical microscope. Photomicrographs were taken using a Leica DFC450C digital camera and Lecia Application Suite (LAS) software.

Light microscopy is a technique used to examine mounted cross sections of paint samples in both visible and ultraviolet light.

Light microscopy was carried out at the Courtauld Institute of Art using an Olympus SBX41 fluorescence microscope with a DP74 digital camera and Olympus stream 1.9.3 image analysis software.

Ultraviolet (UV) Fluorescence is a technique used to analyse components within the painting which fluoresce differently under ultraviolet light. It can be used to indicate the presence of certain fluorescing pigments, retouchings and aged natural resin varnishes.

Two ultraviolet tube lights emitting between 395-450nm were used to illuminate the surface of the painting. Photographs were taken in the Courtauld Institute of Art photography studio using a Canon 600D Camera with an 18-55mm lens and a UV filter in front of the lens to absorb visible light and light with a short wavelength.

Infrared Reflectography (IRR) is a technique used to identify the presence of carbon within the layer structure of the painting. It can be used to identify underdrawings undertaken in a carbon-based material and can be used to establish whether changes have been made to the composition.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

IRR was carried out at the Courtauld Institute of Art using an OSIRIS IRR imaging camera with a spectral sensitivity of 0.9 - 1.7µm. Further Infrared imaging was carried out using an adapted Canon 600D Camera with an 18-55mm lens, a 270µm filter and a spectral sensitivity of 1.0µm. In both instances the painting was illuminated with tungsten halogen lamps positioned at either side of the painting.

X-radiography is a technique used to analyse aspects of the painting which may not be visible to the naked eye, being obscured by subsequent layers. the X radiographs produced indicate where heavy metals have absorbed the X-rays emitted, and prevented them from darkening the plate. The technique can therefore be used to analyse elements of the painting undertaken with heavy metal pigments such as lead white, used in priming layers or in the paint layers. It can additionally reveal losses or changes within the composition.

X-radiography was carried out at the Courtauld Institute of Art using one plate using 20 KeV and 4.3 mA with a 20 second exposure.

X-ray Fluorescence Spectroscopy (XRF) is a technique that is used to identify inorganic elements present throughout the layer structure of a painting.

XRF was carried out at the Courtauld Institute of Art. Point analysis was carried out of 6mm volumes at selected sites using 40KeV, 11.90µA for 60 seconds using a Bruker TRACER III instrument.

Scanning XRF is a technique used to identify the presence of inorganic elements throughout the layer structure of the painting, through the production of elemental maps.

Scanning XRF was carried out at the Courtauld Institute of Art using a M6 Jetstream instrument from Bruker Nano GmbH, with a 30 W Rh-target micro-focus X-ray tube mounted with two 60 mm2 SDDs (with have an energy resolution of < 145 eV for MnKα) on a motorized stage. The tube uses a polycapillary X-ray lens to focus the beam and has a maximum voltage of 50 kV and a maximum current of 0.6 mA. The elemental maps were processed using the Bruker Jetstream software.[92]

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[92] Stonor, K. Richardson, C. Amato, S. R. Nevin, A. & Burnstock, A. 'Rubens's Death of Hippolytus (1610-12): How scanning XRF shed new light on old questions', *Lasers in the Conservation of Artworks XIII*, Published online: Taylor and Francis, 2024, p. 8.

Sarah Brokenborough and Grace Storey - *Mary, Queen of Scots* (CIA 2926, RCIN 407498)

Scanning Electron Microscopy with Energy-dispersive X-ray spectroscopy (SEM-EDX) is a technique used to analyse cross sections of samples taken from a painting in order to characterise the inorganic elements present and produce elemental distribution maps.

SEM-EDX was carried out at King's College London, using a Hitachi S4000 with a Field Emission Gun and EDX performed with an Oxford Instruments INCA system and Aztec software to convert the data.

Fourier-transform Infrared Spectroscopy (FTIR) is a technique used to analyse the inorganic materials present in a sample taken from a painting through the generation of spectra which can be compared to spectra taken from reference libraries of known materials.

Analysis was carried out at the Courtauld Institute of Art using a Bruker Lumos II FT-IR Microscope in transmission mode, and OPUS software.

Appendix III: Map of inscriptions on the Verso

Before Treatment, General View, Verso, Ordinary Light.

Appendix IV: Inscriptions on verso

	Inscription	Photograph	Materials
1.	Mary Queen of Scots.		Black script, medium unidentified.
2.	"om" with what appears to be the tail from a letter "F" likely "from". The next section down contains the end of a word "rne" likely "Osborne" The final section contains a comer and the date "1902."		Partially torn paper label which appears to have been cut and partially removed. 8.4cm in height and 3.2cm in width at its widest point. The inscription appears to have been written in black ink.
3.	"From Buckingham Palace 24. 6. 1926."		Small paper label, unevenly cut approximately 1cm high and 10cm long. Appears to have been typed in black ink using a typewriter.
4.	"w___dsor Castle/ _____ry of pictures/ __ 2911" contextual evidence suggests it may read "Windsor Castle" then "inventory" or "treasury" "of pictures."		A paper label, approximately 3.2cm high by 6cm wide, edged by a blue ink printed octagonal design. The Writing has been executed in a black/brown ink.
5.	"407498"		White paint applied directly.
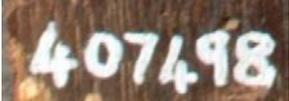
6.	circular motif featuring a crowned "VR" for "Victoria Regina"		Stamped directly onto the panel in a black substance standing slightly proud of the wood.
7.	Oval motif reading "Osborne inventory 187_" The last number is possibly a 5 or a 2. The number in the centre reads "N_ (possibly a 2) and then a stamped "807".		Stamped directly onto the panel in a black substance which stands slightly proud of the wood.
8.	crowned "A". This was Prince Albert's personal brand identifying the painting as the personal property of Prince Albert.[93]		Stamped directly into the panel.

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[93] Op. Cit. Whitaker, L. 2012, p. 13.

Appendix V: Sample Site Map

Before Treatment, General View, Recto, Ordinary Light.

Appendix VI: Cross Section Analysis and SEM - EDX

A Cross section was produced to determine the layer structure of the painting and to allow analysis to further characterise the paint and ground layers.

Cross section 1

Location: cross section 1 was taken from a section of loss in the green background from the top left-hand corner of the painting.
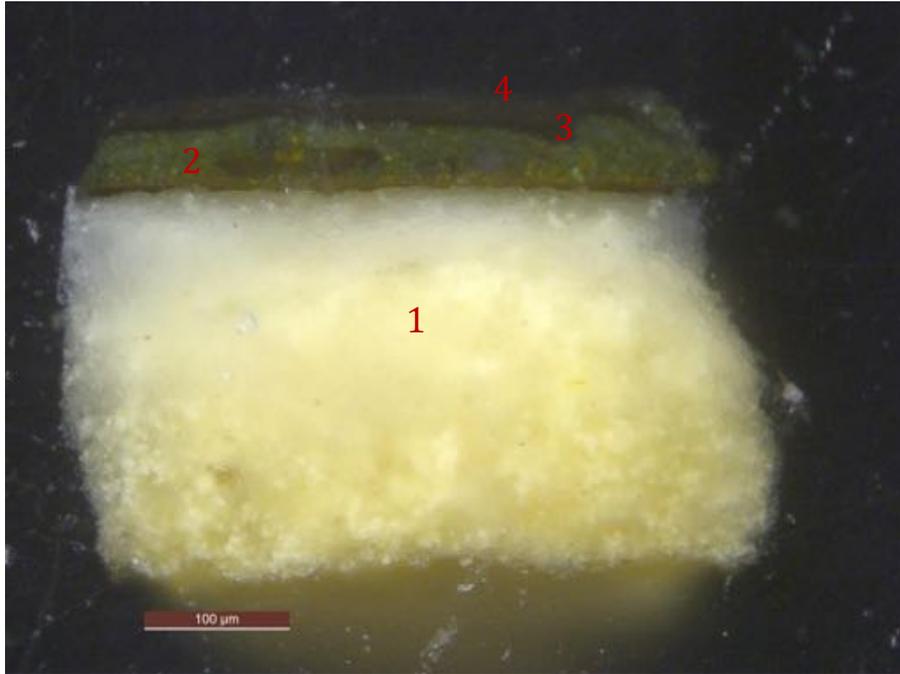

Sample 1: Normal Light 100 um
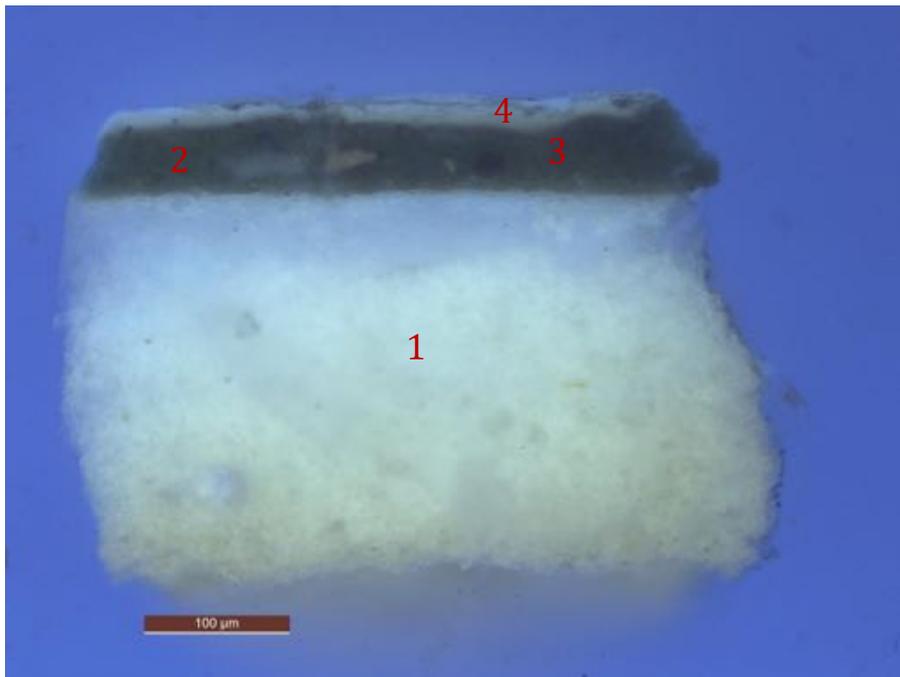
Sample 1: Ultraviolet Light 100 um

Cross Section 1			
Layer	Description	SEM - EDX Results	Further Analysis
1.	Creamy yellow ground layer	Ca **Pb** Si As	Calcium from chalk or gypsum ground layer. Lead white Silicon impurities in the chalk Arsenic, possibly traces from Emerald Green layer above.
2.	Green matrix with a mix of green particles, some round, cooler toned particles characteristic of emerald green and some more yellow-toned green particles. Further particles are white or brown.	**Cu + As** **Pb** **Fe + K + Mg + Al + Si** **Ca** P	Emerald Green. Lead White. Green Earth Calcium most likely from the ground layer. Phosphorous impurity
3.	Green-brown layer containing similar mixtures of pigments to the layer it is above	**As + Cu** **Fe + K + Mg + Al + Si** **Pb**	Emerald Green – Known to degrade to brown arsenic oxides. Green Earth. Lead White
4.	Surface Coating	N/A	Organic material

EDS Layered Image 1
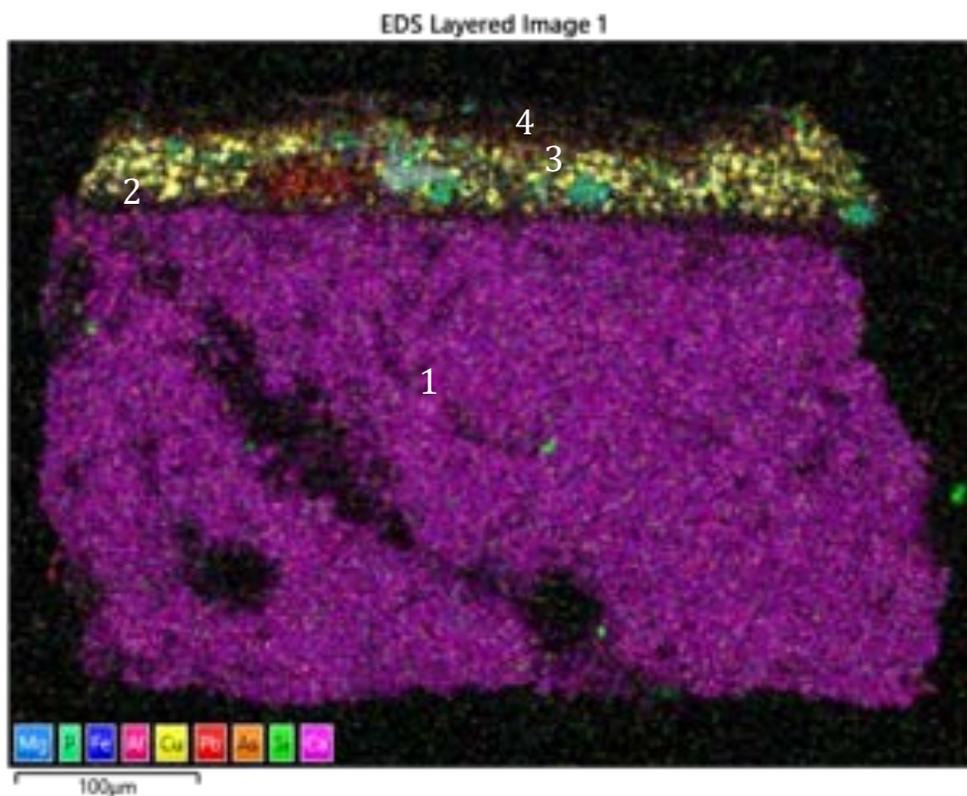
Sample 1: SEM EDX layered map of Copper, Arsenic, Calcium, Lead, Silicon, Iron, Aluminium, Magnesium and Phosphorous.

Ca Kα1

Si Kα1

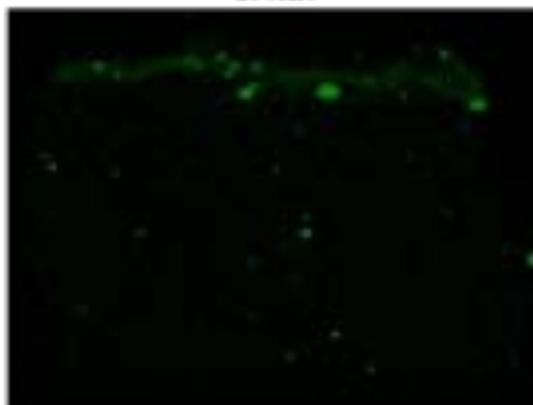As Lα1,2

Cu Kα1

Fe Kα1

Mg Kα1,2