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Forever Gothic? Analysis and Interpretation of the Interior of the Great North Bedchamber at Strawberry Hill

Christina C. Lombardo
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Presented to the Faculties of the University of Pennsylvania in Partial Fulfillment of the Requirements of the Degree of Master of Science in Historic Preservation 2006.
Advisor: Gail Caskey Winkler

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FOREVER GOTHIC?
ANALYSIS AND INTERPRETATION OF THE INTERIOR OF THE
GREAT NORTH BEDCHAMBER AT STRAWBERRY HILL

Christina Celeste Lombardo

A THESIS
In
Historic Preservation

Presented to the Faculties of the University of Pennsylvania in
Partial Fulfillment of the Requirements of the Degree of

MASTER OF SCIENCE IN HISTORIC PRESERVATION
2006

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1.0 Introduction

Strawberry Hill has been written about extensively in association with the Gothic Revival, and especially architecture and 18th century interior design. English Heritage has listed it as a Grade I building, the highest category of heritage designation; the surrounding grounds are Registered Grade II*. Despite its significance, the most important portion of the house is in an extremely fragile state. The vulnerable position of the building has led English Heritage to include it on the Buildings at Risk Register and on the World Monument Fund’s 2003 list of 100 most endangered sites.

Since its construction beginning in about 1698, the building later known as Strawberry Hill has had numerous owners and has undergone various alterations, but two significant periods in its history should be noted. The first was during the ownership of Horace Walpole, a politician, collector and writer, author of the first “gothic” novel, *The Castle of Otranto*, and a leader in the 18th-century Gothic Revival movement; this period extends from Walpole’s acquisition of the house in 1747 until his death in 1797. During his ownership, Walpole greatly altered and enlarged what was once a very small house by incorporating Gothic elements that were both derivative and historically-based. The significance of these alterations has been well documented and has led to Strawberry Hill’s recognition as one of the most significant and influential buildings of the early Gothic Revival.

Following Walpole’s death, the house passed through a succession of owners until it came into the possession of Lady Frances Waldegrave in the mid-19th century. Under Lady Waldegrave’s ownership from 1846 to 1879, the house underwent a second phase of extensive alterations, partially to compensate for almost 50 years of general neglect. Walpole’s original building was “restored” and a substantial wing added to
accommodate the numerous political receptions hosted by Lady Waldegrave. Today the house remains substantially the one she created.

Most of the information written about Strawberry Hill and its role in the Gothic Revival movement in England is based on archival documents that focus on only a few key spaces and present a broad overview of changes over time. This thesis is intended to produce very detailed information about the original appearance and subsequent changes to one specific space within the house--the Great North Bedchamber. This significant semi-public room has yet to be studied in detail, either as an individual space or as part of the greater context. In addition to archival research, laboratory analysis of existing finishes was conducted as part of this thesis, thereby providing a technical perspective from which to understand the contributions made by Walpole and Waldegrave.

This is an important time in the history of Strawberry Hill. A major restoration of the house is in the early planning stages, and concurrently, stewardship of the house is in the process of changing from private to public hands. Information gathered as part of this thesis may serve to broaden existing knowledge of the Great North Bedchamber and aid in interpretation of the space, as well as provide a model approach for the future study of other rooms in the house.

Reconsidering the Gothic Revival

The use of Gothic elements in architecture of the 18th and 19th centuries has been the subject of much scholarship. Discussion has focused on which century’s revival should be considered the more important or relevant: the romantic 18th century ‘Gothic with a k’ or the archaeological 19th century Gothic Revival. Whether or not the two periods represent individual revivals, or should be looked at as facets of a single
movement has provoked much debate. These revivals are contrasted against the idea of “Gothic survival,” the acknowledged uninterrupted use of Gothic elements and motifs from medieval time to the present. Responses to these questions and issues are often conflicting, depending on whether the author was sympathetic or dismissive. The discussion began with Charles Locke Eastlake’s (1836-1906) *A History of the Gothic Revival*, published in 1872 while still within the grasp of the 19th century Gothic Revival. Eastlake advocated for the historically driven revival of the 19th century. This was followed by Kenneth Clark’s *Gothic Revival* in 1928, and his view that the 18th century version provided the only unique contribution to architecture. In December of 1945, an entire issue of *The Architectural Review* was devoted to the Gothic Revival, and was prefaced as providing, “an interim statement on the new aesthetic and historical approach to Gothicism.”¹ Sir Howard Colvin’s 1948 article in *Architectural Review*, entitled, “Gothic Survival and Gothic Revival,” followed shortly thereafter. Colvin’s article addressed the concept of a continuous and ongoing Gothic style, and looked at distinctions between churches that were “unconsciously” constructed with the same Gothic motifs that had been used for centuries and those churches where Gothic elements were consciously chosen. In 1974, Terrence Davis called for a reappraisal of 18th century Gothic in his *The Gothick Taste*. This was followed by Michael McCarthy’s *The Origins of Gothic Revival* in 1984 and his discussion of the role of the Picturesque movement in Gothic Revival. The deliberation continues.

Strawberry Hill figured prominently in all of these written histories. Partially this inclusion is based on Walpole’s promotion of the house during his lifetime and the documentation that he left to posterity, thus enabling subsequent generations to have a

more complete understanding of Strawberry Hill’s evolution. To what extent this available documentation has influenced Strawberry Hill’s recognition and how much is based on its true significance is an ongoing discussion. Recently, Susan Kleckner’s thesis, “Strawberry Hill: A case study of the Gothic Revival,” reviewed all facets of these ongoing debates. She argues not only for the role that Strawberry Hill played in Gothic Revival, but also that the two revivals represent one movement.²

2.0 Strawberry Hill

Figure 1: Strawberry Hill, with Lady Waldegrave’s addition (left) and Walpole’s original house and towers (center and right), view northwest, 2005 (Sarah Katz)

2.1 Location

Strawberry Hill is located near the River Thames, in the town of Twickenham, approximately 11 miles southwest of London (Figure 1). The house is now situated within the 35-acre complex of St. Mary’s College and is bordered by Waldegrave Road to the north and west, Strawberry Vale to the east and Waldegrave Park to the south. The surrounding area is comprised mostly of residences with some commercial use.

When Horace Walpole purchased Strawberry Hill, the house was located in a fashionable area that was largely undeveloped, but not in the least bit isolated.\(^3\) With the Thames serving as a central thread, mansions such as Ham, Chiswick and Syon were

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within the near vicinity, as well as Hampton Court palace and parks such as Kew. The neighborhood provided both entertainment and seclusion, as desired.\textsuperscript{4} The attraction of the area was further increased by its proximity to London.

2.2 History

In his \textit{A Description of the Villa of Mr. Horace Walpole… (Description)}, \textsuperscript{5} Walpole outlined the beginnings of the house known locally as “Chopp’d Straw Hall” which would become the celebrated Gothic Revival villa Strawberry Hill. Constructed in 1698 by the coachman to the Earl of Bradford, the house was, “originally a small tenement… let as a lodging-house.”\textsuperscript{6} The house went through a succession of tenants until it was let by Mrs. Elizabeth Chenevix, a well-known London toy shop owner. Walpole took over her lease in May 1747, and the following year purchased the house and its accompanying five acres outright from the Mortimer minors.\textsuperscript{7} He immediately began altering the small house, assisted by William Robinson (about 1720-1775) from His Majesty’s Board of Works. Not until 1749 did he begin consciously using Gothic elements and motifs, and by January 1750, Walpole outlined his plan for the house in a letter to Sir Horace Mann: “I am going to build a little Gothic Castle at Strawberry Hill.”\textsuperscript{8}


\textsuperscript{6} Ibid., 1.


Walpole’s first addition to the house, the Library/Refectory wing along the north elevation, was completed in 1754 (Figure 2, room A and Figure 3, room F). This was followed by the addition of a third floor of bedchambers in 1755 and construction of the Little Cloister, pantry, and Holbein Chamber in 1758-1759 (Figure 2, room G and Figure 3, room E). These rooms were added to the west of the original house block, changing its symmetrical configuration to one of intentional asymmetry. Continuing the westward expansion, the Round Tower and Great Cloister were added in 1761 (Figure 2, rooms K and N, Figure 3, room A). These rooms were followed by the Gallery and Chapel (also known as the Cabinet or Tribune) in 1763 (Figure 3, rooms B and D). The last additions to the house proper were the Great North Bedchamber finished in 1772 (Figure 3, room C), and the Beauclerc Tower completed in 1776 (Figure 3, room G). Walpole constructed a very large, separate building, known as the New Offices, to the south of the main house in 1790. While his house was undergoing expansion, Walpole was also extending the acreage of the estate; the original five acres were increased to 46.

Walpole died on March 2, 1797, and left life tenancy at Strawberry Hill along with a £2,000 annual allowance to cover maintenance costs to his niece, Anne Seymour Conway Damer (1749-1828). The collection that Walpole had spent a lifetime acquiring and for which, to a great extent, Strawberry Hill’s many expansions had been designed to accommodate, remained within the house. In 1810, Mrs. Damer relinquished the

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10 This report will use the American convention of labeling floors, where “first floor” is equivalent to the British ground floor, “second floor” identifies British first floor, and “third floor” is equivalent to British second floor.
12 Construction of the Round Tower was not completed until 1771. Ibid., 80.
13 Ibid., 76.
14 Ibid., 82.
15 Ibid.
Figure 2: First floor plan of Strawberry Hill, 1781 (Horace Walpole, *A Description of the Villa of Horace Walpole*, collection of Lewis Walpole Library)
Figure 3: Second floor plan of Strawberry Hill, 1781 (Horace Walpole, A Description of the Villa of Horace Walpole, collection of Lewis Walpole Library)
estate to its new heir Elizabeth Laura Waldegrave (1760-1816), granddaughter of Walpole’s brother Edward and who was known to Walpole as “Lady Laura.”

Strawberry Hill stayed within the Waldegrave family, passing from Lady Laura to her son, John James Henry, 6th Earl Waldegrave (1785-1835), and then to George, 7th Earl Waldegrave (1816-1846). The 7th Earl was married to Frances Elizabeth Anne Braham Waldegrave in 1840, and the newlyweds resided at Strawberry Hill until 1841, when the Earl was sentenced to six months in prison for assault on a policeman. Disgruntled over his treatment by Twickenham authorities and possibly because of “pecuniary embarrassments, real or supposed,” the Earl decided to sell off Walpole’s renowned collection and the remaining contents of Strawberry Hill, with the exception of family portraits, and let the vacant house decay as a symbol of his indignation. The sale was conducted at Strawberry Hill in April and May of 1842 and lasted for 24 days, followed by an additional nine-day auction held in London devoted solely to the sale of the unwanted portraits. The combined auctions realized more than £33,000.

Lord Waldegrave died in 1846 and having no heirs left Strawberry Hill to his wife, Frances. Strawberry Hill continued to remain uninhabited and a visitor to the house in 1854 noted that, “the queer old Gothic fabric… was fast falling into ruin. The plaster was peeling off, and the bare lath exposed in many places. The rooms, too, were all

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19 Using a retail price index to convert to 2005 currency, the amount would be more than £2.2 million (http://eh.net/hmit/ppowerbp/); Hewett, Strawberry Fair: A Biography of Frances, Countess Waldegrave, 1821-1879, 42.

In 1856, Lady Waldegrave, now remarried to George Granville Harcourt (1785-1861), decided to restore the house. Well known as a great hostess, her desire to repair and use the building for grand parties was partly inspired by the same reasons that had driven Walpole to purchase the house one hundred years earlier – its rural character and close proximity to London. By June of that year, she was able to welcome her first guests and the house was, “lit up, full of life…a magical contrast to what it was.”

Walpole’s rather diminutive house was unable to accommodate the great number of guests that Lady Waldegrave, now acting as political hostess for the Liberal party, included in her “Saturday to Monday” parties. To compensate, the New Offices were reconfigured as bedchambers and connected to the main house via a covered walkway. This proved somewhat inconvenient, and by 1860 Lady Waldegrave was planning a large addition to Strawberry Hill, connecting the main house to the New Offices, and providing reception rooms that were equal to her needs as a celebrated hostess. The addition, which she largely designed herself, was begun in 1861, and was personally supervised by Lady Waldegrave so that “her plans for decoration and furnishing took up every moment she could spare from politics and society.” The new addition doubled the size of the house, effectively transforming it from a little Gothic castle into a mansion. She also preserved the old house, sometimes augmenting its Gothic character through additional embellishments. At this time Lady Waldegrave also reconfigured and

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22 Hewett and Carlingford, ... And Mr. Fortescue: A Selection from the Diaries from 1851 to 1862 of Chichester Fortescue, Lord Carlingford, K. P, 93.
23 Ibid., 177.
enlarged the main entrance along the north elevation and added an additional story to both the Round and Beauclerc towers.

Lady Waldegrave died unexpectedly in 1879, and Strawberry Hill passed to her fourth husband, Chichester Fortescue (1823-1898), later Lord Carlingford and then Lord Clermont. In June of 1883, Lord Clermont auctioned off 11 lots from the Strawberry Hill estate. By November of that year, construction of new houses on these lots was already underway and a second auction of 50 more lots was held.\textsuperscript{24} Strawberry Hill itself did not sell in the earlier June auction, but was later purchased by the wealthy financier Baron Hermann de Stern (1815-1887).\textsuperscript{25} Local papers noted the Baron, “intends to reside in the historic house and preserve the estate intact.”\textsuperscript{26} The contents of the house, except for a few heirlooms, were sold in a separate ten-day auction. How much time the Baron actually spent at Strawberry Hill is debatable, as local papers in 1886 specifically list the Baron as not residing there.\textsuperscript{27} Upon his father’s death, Herbert Alfred Stern, later Baron Michelham (1851-1919), inherited the property.\textsuperscript{28}

Strawberry Hill became the property of Aimée Geraldine Stern (1882-1927), the Dowager Lady Michelham, in 1919, and the house was once again listed for sale in 1923. By this time it was beginning to show its age,

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{24} "A New Residential Locality," \textit{Builder} (1883): 673.
\item \textsuperscript{26} T. Selwyn, \textit{The Interregnum, 1882-1892: Extracts from the Richmond and Twickenham Times} (1965), 99.
\item \textsuperscript{27} Ibid., 101.
\item \textsuperscript{28} On his death, the New York Times reported Baron Stern’s personal estate as one of the largest proved in 1888, totaling more than £3.5 million. "Large personal estates," \textit{New York Times}, January 14, 1889.
\end{enumerate}
\end{footnotesize}
its general aspect is rather forlorn. The original stucco has been replaced by Portland cement with funereal effect, the meadows are intersected by a new road, and the whole place is hemmed in by streets of tiny houses.\(^{29}\)

The house was purchased by the Catholic Education Council and in 1925 the Roman Catholic teacher training college, St. Mary’s College of Education, moved into Strawberry Hill.\(^{30}\) In order to preserve and protect Walpole’s original portion of the house proper, it was “repaired and assigned for the use of the resident teaching staff,”\(^{31}\) Vincentian priests who were described as having, “a very proper tender Care of the House.”\(^{32}\) Lady Waldegrave’s additions were, “adapted for the service of the College, the old ball-room being reserved as an assembly room for the students.”\(^{33}\) A large addition, also in the Gothic manner, was constructed in 1925 south of the New Offices by architects Pugin & Pugin who planned its location, “in order to preserve the amenities of the site, with its splendid lawns.”\(^{34}\)

In 1958, architect Sir Albert Richardson repaired the roof over the Gallery, Hall and Library and removed Lady Waldegrave’s 19\(^{th}\) century addition to the main entrance, restoring its original configuration. Other repairs were completed in the late 1970s. In 1996, an analysis of painted finishes in the staircase, armory and hall was completed by Lisa Oestreicher.\(^{35}\) Also in the 1990s, the Vincentian priests left Strawberry Hill. However

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\(^{31}\) "St. Mary’s College, Strawberry Hill, Twickenham," *Builder* 129 (1925): 736.


\(^{33}\) "St. Mary’s College, Strawberry Hill, Twickenham," 736.

\(^{34}\) Ibid.

\(^{35}\) Lisa Oestreicher, "The Staircase, Armoury and Hall, Strawberry Hill" (Royal College of Art/V&A Museum, 1996).
St. Mary’s College, now part of the University of Surrey, continues to occupy the house and all of its additions as well as the surrounding 35 acres.36

Management of the Walpole portion of the house is currently in transition, as negotiations are underway for the Strawberry Hill Trust to lease this part of the house from St. Mary’s College, with the goal of making it more accessible to the public. The Trust is also working with the World Monuments Fund in Britain and Inskip + Jenkins, architects, on a major restoration of the house, now in the early planning stages, which is partially supported by a grant from the Heritage Lottery Fund.

2.3 Horace Walpole

To better understand Strawberry Hill, it is necessary to look closer at its creator. Born September 24, 1717, Horatio Walpole37 was the youngest of four sons of Sir Robert Walpole, the 1st Earl of Orford (1676-1745), and Prime Minister of England for over 20 years. The young Walpole attended Eton and King’s College, Cambridge, after which he concluded his formal education with a Grand Tour of Europe accompanied by the poet, Thomas Gray (1716-1771). Upon his return in 1741, Walpole took a seat in Parliament and served in various capacities until he retired in 1768.38 Upon the death of his nephew in 1791, Walpole succeeded to the title of 4th Earl of Orford.39 He never married and had no children.

37 Walpole’s given name was usually contracted to Horace.
39 Walpole inherited the title from his nephew, George Walpole, 3rd Earl of Orford (1730-1791), who died December 5, 1791. The 3rd Earl suffered from bouts of insanity and is known for selling the vast family art collection to settle his debts and those of his predecessors. The collection, which had been accumulated by Walpole’s father, Robert, 1st Earl of Orford, and documented by Walpole himself in his first book Aedes Walpolianae, was sold to Catherine the Great of Russia for her new gallery at the Hermitage.
Walpole is best known as a writer and chronicler of 18th-century English society and culture contained in his more than 4000 extant letters. Because his letters provide a wealth of primary documentation on events, people and practices, quotes from Walpole’s correspondence are included in most texts on 18th-century England. In addition to his correspondence, Walpole also completed works of both fiction and non-fiction. His *Castle of Otranto* (1762), acknowledged as the first “Gothic” novel, was described by Charles Eastlake as, “the first modern work of fiction which depended for its interest on the incidents of a chivalrous age, and it thus became the prototype of that class of novel.”40 In works of non-fiction, Walpole’s *Anecdotes of Painting in England* (1762), “earned him recognition as a pioneer of art-historical studies.”41 Walpole also established a private press, printing works by himself and his friends, including Thomas Gray’s early poems.

A collector and antiquarian, Walpole was a Fellow of the Society of Antiquarians. His additions to the original small tenement building which was to become the castle of Strawberry Hill were made partly to accommodate his ever-growing collection. As Clive Wainwright noted, “Walpole’s collection … constituted an essential part of the interiors of his house … [the] whole character was created and dictated by the objects shown within … or in the case of ancient tiles and stained glass, actually built into the structure.”42 Both the house and collections were intriguing enough to attract numerous tourists.

42 Ibid., 17.
Mr. Walpole is very ready to oblige any curious Persons with the Sight of his House and Collection; but as it is situated so near to London and in so populous a Neighbourhood, and as he refuses a Ticket to nobody that sends for one, it is but reasonable that such Persons as send, should comply with the Rules he has been obliged to lay down for showing it.

Any Person, sending a Day or two before, may have a Ticket for Four Persons for a Day certain.

No Ticket will serve but on the Day for which it is given. If more than Four Persons come with a Ticket, the Housekeeper has positive Orders to admit none of them.

Every Ticket will admit the Company only between the Hours of Twelve and Three before Dinner, and only one Company will be admitted on the same Day.

The House will never be shown after Dinner; nor at all but from the First of May to the First of October.

As Mr. Walpole has given Offence by sometimes enlarging the Number of Four, and refusing that Latitude to others, he flatters himself that for the future nobody will take it ill that he strictly confines the Number; as whoever desires him to break his Rule, does in effect expect him to disoblige others, which is what nobody has a right to desire of him.

Persons desiring a Ticket, may apply either to Strawberry-Hill, or to Mr. Walpole's in Berkeley-Square, London. If any Person does not make use of the Ticket, Mr. Walpole hopes he shall have Notice; otherwise he is prevented from obliging others on that Day, and thence is put to great Inconvenience.

They who have Tickets are desired not to bring Children.

Figure 4: "The Rules for Seeing Strawberry Hill," 1784 (Horace Walpole, A Description of the Villa of Horace Walpole, collection of Lewis Walpole Library)
during Walpole’s lifetime, so much so that he instituted tickets and rules for visitation (Figure 4).⁴³

Walpole’s initial alterations and additions to Strawberry Hill incorporated derivations of Gothic details and motifs. These designs were overseen by a “Committee on Taste,” originally comprised of Walpole, John Chute (1701-1776) and Richard Bentley (1708-1782). Walpole had met John Chute in Florence, while on his Grand Tour. Chute’s influence in the design and building at Strawberry Hill was enormous and on his death he was described by Walpole as, “… my oracle in taste, the standard to whom I submitted my trifles, and the genius that presided over poor Strawberry.”⁴⁴ Richard Bentley was to contribute to Strawberry Hill designs that were a mix of flamboyant Rococo and Gothic. A precocious designer—he had matriculated Trinity College at the age of 11—Bentley was financially irresponsible and forever eluding creditors. Walpole tried to be supportive, but Bentley’s chaotic and transitory lifestyle eventually led, in 1761, to a falling out. Thomas Pitt (1739-1793), the 1st Baron Camelford, replaced Bentley on the Committee.⁴⁵ Pitt, a graduate of Cambridge, contributed to the building of Strawberry Hill by providing designs for ornaments in the Long Gallery, including the mantelpiece, and in the Tribune. His later work, not at Strawberry Hill, incorporated a Palladian vocabulary that demonstrated his ability as an, “amateur architect with more than amateur talent.”⁴⁶

In his later additions to Strawberry Hill, Walpole came to rely more and more on designs based on historical precedent, although these designs often came from

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⁴³ In 1804, Thomas Hope followed Walpole’s precedent and also offered tickets to preview his home and collections.


illustrations and Walpole continued to adapt both material and function to suit his needs, forming painted wood bookcases from carved stone choir screens and chimney-pieces from tombs. For later alterations, Walpole employed a succession of professional architects, among them Robert Adam (1728-1792), who was responsible for the design of the ceiling and chimney-piece in the Round Drawing Room. James Essex (1722-1784) and James Wyatt (1746-1813), who both contributed to the design of the New Offices, were also employed by Walpole.

2.4 Frances, Lady Waldegrave

Strawberry Hill would not be what it is today without the intervention of Lady Waldegrave, who was born Frances Elizabeth Anne Braham on January 4, 1821, in Tavistock Square London. She was the third of six children, with four brothers and one sister. Her father, John Braham (c.1777-1856), was a well known vocalist; her mother was Frances Elizabeth Bolton (1799-1846). Frances Braham married John James Waldegrave (1814-1840), the eldest (and illegitimate) son of the 6th Earl Waldegrave, on May 25, 1839 at Holy Trinity Church, Brompton. The couple spent much time at Strawberry Hill, which was owned by John’s legitimate brother George, 7th Earl Waldegrave. John Waldegrave was handsome, though sickly, and he died shortly after the marriage in April 1840 from delirium tremens and epilepsy. Lady Waldegrave then married George Edward, the 7th Earl Waldegrave on September 28, 1840. The marriage was conducted at St. George’s Episcopal Chapel in Scotland to circumvent the Marriage


48 Born John Abrahams, of German Jewish descent. Braham changed his name by dropping the “A” to obtain employment.

Act of 1835 which prohibited a widow from marrying her husband’s brother. For the first sixth months of their marriage, the 7th Earl was confined to the Queen’s Bench prison for unruly pre-marriage behavior. Lady Waldegrave joined her husband in his confinement, and during this time became pregnant and miscarried. The miscarriage may possibly have been a result of stress from both the perceived questionable legality of their marriage and their internment. This was her only pregnancy and she never had any children.

Following Lord Waldegrave’s death of cirrhosis of the liver in 1846, Lady Waldegrave married George Granville Harcourt, who was many years her senior. Under his tutelage, Lady Waldegrave learned the tenets of “society,” was exposed to politics, and began hosting the lavish parties that would establish her as political hostess for the Liberal party. After Granville’s death in 1861, Lady Waldegrave married for a fourth and final time in 1863 to one of her most ardent admirers, Chichester Fortescue, later Lord Carlingford and then Lord Clermont. Admired for “her beauty, her wide sympathies with all manner of excellence, her rare kindness of heart, her social agreements, and her sparkling vivacity,” Lady Waldegrave continued hosting political parties throughout the 1860s and 1870s.50 Though a loyal supporter of the Liberal party, her “reception rooms were open to Whigs, Tories, and Radicals, as well as to representatives of art, science and literature. She broke away the last barriers of exclusiveness, and socially helped more than anyone to destroy the lines of cleavage.”51 Strawberry Hill was considered the “Mecca towards which the eyes of the ambitious turned with longing looks, for it was there that Lady Waldegrave held court, and very carefully did she choose her

courtiers. Upon her death in 1879, she was recognized as “the queen of the salon,” and together with her husband Lord Clermont, was said to “have exercised a broader and deeper influence upon the Liberal Party than its prominent and recognized chiefs.”

While Lady Waldegrave entertained at her residences, both in London and in the countryside, Strawberry Hill was highlighted as the place in which, “her fame and memory are most intimately associated.” She is responsible for restoring and revitalizing the house when it was at a point of considerable decline. She also endeavored to restore some of Walpole’s collection, gathering Walpole’s own books and copies of those printed at Strawberry Hill press as well as a “portion at least of the art treasures in which it once abounded.” Her significant alterations to the house were viewed by the press of the day as respectful to Walpole’s intent, “from the original conception of its founder there was no departure or divorce.” Lady Waldegrave herself complained in 1876, “I now constantly find young people thinking that Horace Walpole made all my pet creations.” One writer, James Wall, even noted in 1866 that it had been “a few years since the old ruined structure was pulled down, and its site is now occupied by an elegant mansion.”

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54 "Death of a Famous Society Leader," 2.
57 "Death of a Famous Society Leader," 2.
59 Wall, "Strawberry Hill," 553.
3.0 Great North Bedchamber

Figure 5: Strawberry Hill, with Great North Bedchamber (left, with projecting bay windows), Tribune (center) and Beauclerc Tower (right), view southeast, 1924 (Country Life)

3.1 Location

The Great North Bedchamber is on the second floor of Strawberry Hill, in the center of the north elevation and dates to Walpole’s last alteration campaign of the 1770s. It is north of the Long Gallery and above rooms formerly used as a Servant’s Hall and Wine Cellar (exterior views, Figures 5-7). The room is rectangular in plan, measuring approximately 18’ (north-south) x 25’ (east-west), with a ceiling height of 13’10”. A small display closet, roughly triangular in plan and measuring 2’10” at its...
Figure 6: “View of the Prior’s Garden at Strawberry Hill,” with Great North Bedchamber (second floor right), view east, 1784 (Horace Walpole, A Description of the Villa of Horace Walpole, collection of Lewis Walpole Library)
Figure 7: “View of the North Side of the House, with the Screen Leading into the Prior’s Garden,” note Great North Bedchamber at center left, view east, watercolor by John Carter, 1784 (Horace Walpole, A Description of the Villa of Horace Walpole, collection of Lewis Walpole Library)
narrowest dimension and 6’11” at its largest, is located adjacent to the northwest corner of the room. Sole access to the closet is through the Great North Bedchamber.

### 3.2 Walpole’s Great North Bedchamber (1770-1797)

#### 3.2.1 Description and Alterations

Between Walpole’s *Description*, which was written in 1774 and updated in 1784, and John Carter’s ink and watercolor picture included in the 1784 edition (Figure 8), a fairly clear understanding of the appearance of the Great North Bedchamber from its conception until the mid-1780s is possible. Walpole’s *Description* gave the construction date of the Great North Bedchamber as 1770. However, his account records and
correspondence indicate that the room was not completed until later. In a letter to Sir Horace Mann in 1772, Walpole remarked that his, “sumptuous state bedchamber... was finished but to-day.”

Walpole described the room as, “hung with crimson Norwich damask,” and it is this wall covering that is visible in the 1784 Carter view. Norwich, located in East Anglia in eastern England, was the center of worsted manufacture in England. A variety of higher quality worsted yarns and fabrics, including mixes of worsted and other fibers such as wool and silk, were produced for both dress and furnishing use. For Norwich manufacturing, the mid-18th century was, “the most flourishing period... when the export market included all of Europe, China, the Levant, the West Indies, Spanish America, and the North American colonies.” While crimson damask was also used in the Long Gallery and the Round Drawing Room, the use of crimson was particularly appropriate in the Great North Bedchamber because of its association with nobility and grandeur and the fact that historically it had been used extensively in state bedchambers.

The Great North Bedchamber also contained numerous portraits and paintings, which Walpole had collected. Many of the portraits were associated with France and the French court, underlying a theme that extended to furnishings and upholstery for Walpole incorporated French-inspired chairs as well as Aubusson and Gobelin tapestry in his design for the room. Among the personages represented in the portraits were Louis XIV and his second wife, Madame de Maintenon, Hortense Mancini (mistress of Charles II), and the famous French lover Ninon de L’Enclos.

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Two carpets covered the bare wood floor. In the center of the room was a carpet, “of the manufacture of Moorfields.” This carpet belonged to a category of English-made carpeting, known as Axminster carpet, which was hand-knotted to imitate true Oriental carpets or designs from Savonnerie, the French Royal carpet manufactory. A second “foot-carpet of needle-work” was located under the state bed. Needlework carpets were generally made of wool sewn on canvas. Walpole procured both carpets in 1773 at a total cost of £16 17s. 0d.

The plaster ceiling in the room was copied from a room at the Vyne, the residence of John Chute, and featured gilding on both the ribbing and drop pendants (Figure 9). Architectural details and picture frames were also picked out in gilt. Walpole records two sums in 1773 for gilding the room, £115 1s. 9d. to “Nichols for gilding new bedchamber frames &c.” and £57 11s. 6d. to Vial “for gilding Frames & new frames for bedchamb.”

The elaborate chimney-piece centered on the south wall was “designed by Mr. Walpole from the tomb of W[illiam] Dudley bishop of Durham, in Westminster” (Figures

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67 Toynbee Paget and Walpole, Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795… With notes and index by Paget Toynbee… With… Illustrations, etc, 15.

68 The ceiling which provided inspiration is currently located in the library at the Vyne. However, the ceiling ribs which make up the design were, coincidentally, relocated from their original location in the North Bedroom as part of a 1830s-1840s remodel. The National Trust, The Vyne (England: The Stellar Press Ltd, 1983), 27.

69 Toynbee Paget and Walpole, Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795… With notes and index by Paget Toynbee… With… Illustrations, etc, 13-14.
10 and 11). The mantel-piece was carved of Portland stone by Thomas Gayfere (c.1721-1812), who received £230 6s. 0d. for the “Chimney of new room &c.” Gayfere was the master mason at Westminster Abbey, a position he held from c. 1762 until his death in 1812, and so had extensive experience working with Gothic details and moldings. The chimney-piece included a life-sized bas relief profile in bronze of Anne of Bretagne in the middle of the large, central ogee arch. At the apex of the arch, in the place traditionally reserved for a poppyhead, was a bust of Francois II, first husband of

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70 Walpole, A Description of the Villa of Horace Walpole, Youngest Son of Sir Robert Walpole Earl of Orford, at Strawberry-Hill, near Twickenham. With an inventory of the furniture... 72.

71 Toynbee Paget and Walpole, Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795 ... With notes and index by Paget Toynbee ... With ... Illustrations, etc, 13-14.

Figure 10: Drawing with design details of mantel-piece in Great North Bedchamber, note bust of François II and medallion with profile of Anne of Bretagne, both now gone, 1823 (Lewis Nockalls Cottingham, Working Drawings for Gothic Ornaments, plate 34)
Mary Queen of Scots. A cheval-type fire screen with a Gobelin tapestry panel provided protection from the direct heat of the fire. Within the mantel-piece was a firebox insert of black and gold marble. The screen was purchased in Paris for £12 12s. 0d., and an additional £17 14s. 10d. was paid “for making up Gobelin screen and two patchwork chairs.”

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73 Toynbee Paget and Walpole, Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795 ... With notes and index by Paget Toynbee ... With ... Illustrations, etc, 15.
Prominently located on the east wall was the state bed with flying tester ornamented with, “tapestry of Aubusson, festoons of flowers on a white ground, lined with crimson silk; plumes of ostrich feathers at the corners.” The Aubusson tapestry had been imported from France. Walpole described the bed as worthy of “Cleopatra on the Cydnus [River], or Venus if she was not past Cupid-bearing.”

The room also contained, “six elbow chairs of the same [Aubusson] tapestry, with white and gold frames; and six ebony chairs,” which were arranged in a symmetrical fashion around the perimeter, as was typical of the period. The six elbow chairs in white and gold were a French-inspired design, similar to plates XX-XXIII in Thomas Chippendale’s *The Gentleman & Cabinetmaker’s Director*, the third edition of which had been published in 1762.

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74 Walpole to Mason, August 24, 1772. *The Yale Edition of Horace Walpole's Correspondence*, v. 28, 42.
1762 (Figure 12), and coordinated with the woodwork and stonework in the room. The six ebony chairs appear to be in the style known as “Wolsey” chairs, for their perceived association with Cardinal Wolsey, but which were in actuality later 17th century pieces from Goa, India. In 1771, Walpole paid £55 5s. 0d. for the bed and four of the armchairs, followed in 1772 by an additional £242 12s. 6d. paid to “Strickland, for hangings, making up bed &c. chairs &c.” The sum for bed hangings and upholstery exceeded even that of the hand carved mantelpiece. This expense underlines the role of the bed as a symbol of status and affluence, but it was the hangings and not the bedstead frame per se that accounted for the cost.

Along the north wall, the two bay windows contained glass painted with coats-of-arms by William Peckitt, for which Walpole paid £28 16s. 0d. Within the window alcoves were “two China porcelaine stools.” Above the bow windows were festoon curtains of crimson with gilded cornices. On the pier between the windows was a composition that included a large looking glass with an ebony frame, a table of “Saracen mosaic,” and two ebony stands, which appear in the Carter view to have barley twist supports. The looking glass was flanked by a pair of ormolu sconces.

The only entrance to the room was at the south end of the west wall. The room’s symmetry was preserved by providing a matching door at the north end of the west wall, which led to a “glazed closet” used to display objects from Walpole’s vast collection.

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76 According to Paget, Walpole entered account information in the year following the actual expense. Toynbee Paget and Walpole, *Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795 ... With notes and index by Paget Toynbee ... With ... Illustrations, etc*, 13-14.
77 Walpole, *A Description of the Villa of Horace Walpole, Youngest Son of Sir Robert Walpole Earl of Orford, at Strawberry-Hill, near Twickenham. With an inventory of the furniture... 74*.
78 Ibid.
Figure 13: John Chute’s design for the glazed closet door, undated (John Chute, Slight Sketches of Architecture, collection number 49.3490, Lewis Walpole Library)
Chute was responsible for the design of both the doors, which featured “medallions of Louis 14th and Charles 5th in bronze” in the panel over the door (Figure 13).\textsuperscript{79}

A few minor changes to the room occurred during Walpole’s time. These included the rearranging of portraits, as he noted in a letter to Countess Ossary, “all this morning I have been busy in placing Henry VII in the state bedchamber, and making a new arrangement of pictures. It is really a very royal chamber now and much improved.”\textsuperscript{80} In 1776, Walpole purchased a chintz quilt for the bed, at a cost of £4 4s. 0d.\textsuperscript{81} Additional small changes in furnishings can be found in the inventories included in the 1774 and 1784 editions of his \textit{Description}. Overall, however, the room appears to have remained relatively static between its completion in 1772 and Walpole’s death in 1797.

### 3.2.2 Function

Walpole constructed the room as a “state bedchamber,” which by the 1770s would have been somewhat of an antiquated notion. It appears that Walpole used the room as a space for entertaining and show. Lady Mary Coke, in her journal of 1774, remarked on her visit to Strawberry Hill that she had never before “seen the fine bed, nor the State Bed Chamber.”\textsuperscript{82} In a letter to Mason, Walpole describes an extravagant party thrown for his nieces and gives detailed descriptions of the public spaces where the party was held, including the Long Gallery, the Round Drawing Room, the Tribune, and

\bibliography{\textsuperscript{79} Ibid., 73.}{\textsuperscript{80} Walpole to Countess of Upper Ossary, June 30, 1785. \textit{The Yale Edition of Horace Walpole’s Correspondence}, 287.}{\textsuperscript{81} Toynbee Paget and Walpole, \textit{Strawberry Hill Accounts. A Record of Expenditure in Building, Furnishing, &c. Kept by Mr. Horace Walpole from 1747 to 1795 ... With notes and index by Paget Toynbee ... With ... Illustrations, etc}, 16.}{\textsuperscript{82} Lady Mary Coke’s Journal 1774. \textit{The Yale Edition of Horace Walpole’s Correspondence}, v. 31, 179.
the Great North Bedchamber, where he notes, “The tapestry bed in the great chamber looked gorgeous and was ready strewed with roses for a hymeneal [wedding].”83 This description clearly points to the room used as part of a suite of rooms for entertainment. John Cornforth notes that the room “was arranged to be looked at rather than used, because [it] had no closets or dressing-rooms that would have been de rigueur at that time.”84 However, Walpole apparently also used the chamber for important guests; in his correspondence to the Honorable Henry Seymour Conway, Walpole writes asking for confirmation of a visit so that, “the state bedchamber may be aired.”85

3.2.3 Design Intent

Walpole’s approach to Gothic can, “never be wholly greed from a suspicion of gentle mockery, of deliberate toying with whimsical nostalgia.”86 In addition to his fanciful use of Gothic motifs, Walpole was also known for his passion for heraldry and heritage. All these characteristics were found in the Great North Bedchamber. A bit of whimsy was evident in the placement of the bust of Francois II at the center of the mantel-piece arch instead of a poppyhead form. Heraldry and heritage were intentionally used to present the passage of time and to give the room an atmosphere of history ranging from medieval Gothic to Middle Georgian.

Medieval history was represented by Gothic elements such as the mantel-piece and chairs. Also alluding to the past was the arrangement of mirror, table, and candle stands on the north wall. As Peter Thornton noted, this arrangement, described as a

83 Walpole to Mason, October 11, 1778. Ibid., v. 28, 446.
84 Cornforth, Early Georgian Interiors, 226.
86 Georgian Group, Bicentenary of Strawberry Hill [i.E. Of its association with Horace Walpole]. A reprint of the proceedings at St. Mary's College on May 16th, 1947. [with plates.], 1.
“triad,” was, “a favorite ornamental feature in elegant rooms from the 1670s until early in the eighteenth century.” By the mid-18th century, candle stands, if used at all, had been relegated from this prominent mid-wall location of earlier generations to the corners of the room. The anachronistic placement of these candle stands was emphasized by the use of wall-mounted sconces, typical of the Georgian period, directly above. Portraits of deceased royalty and stained glass windows of heraldry further emphasized the presence of the past, and would have elicited recognition from Walpole’s visitors. As John Cornforth stated, “part of the pleasure of visiting houses… was seeing the portraits they contained and recalling the lives and ancestry of those depicted.”

Recent history was represented by the crimson damask wall covering and gilded architectural details which reflected the rich coloring and taste of a previous generation and were reminiscent of Houghton Hall, Walpole’s father’s grand country home, which was constructed in the 1720s and 1730s. The flying tester state bed also served as a reference to this recent past. To these historical elements, Walpole added French chairs, Aubusson tapestry bed hangings, and a Moorfields carpet that were of the latest fashion in the 1770s. Both the symmetrical arrangement of furniture around the perimeter of the room and the use of coordinated upholstery for walls, furniture, hangings, and curtains were also typical of the Georgian period. The introduction of contemporary taste was justified by Walpole who admits, “I do not mean to make my house so Gothic as to exclude convenience, and modern refinements in luxury.” The room was intended to be perceived as a fashionable space with a long history, and

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89 Walpole, *A Description of the Villa of Horace Walpole, Youngest Son of Sir Robert Walpole Earl of Orford, at Strawberry-Hill, near Twickenham. With an inventory of the furniture... iii.*
served as a background for Walpole’s varied collection of objects with their own historical associations.

In Walpole’s public tours of Strawberry Hill, the Great North Bedchamber was the last room visited before the tour continued into the garden, and as Anna Chalcraft notes, it was the “denouement” of the tour.90 Its location, tucked away behind the Long Gallery, reinforced the impression of entering a secluded private family space, one that the visitor was privileged to view. The room was not as overtly dramatic as others, but the state bed provided a striking focal point and the size of the room, contrasted with the petite scale of the other bedrooms in the house, left the visitor with the impression of grandeur that Walpole hoped to create. The Great North Bedchamber provided the perfect transition from the grand Long Gallery to the more subtle beauty of the garden. Walpole’s tour of the interior therefore ended on a subdued, yet still grand note that revealed a quick, but consciously staged, peak into the “private” life of the owner.

Was Walpole’s approach to a Gothic interior typical of the period? Although Fonthill Abbey was constructed later than Strawberry Hill (building continued from 1796 until 1818) and was of a grander scale, it can provide a general comparison of how other Gothic interiors were finished. Its owner, William Beckford (1760-1844) was, like Walpole, an avid collector and rooms within the Abbey highlighted his collection. He furnished the house with older pieces of furniture, mostly of the 17th century, as well as new furniture designed in a Tudor or Gothic style, and like Walpole, incorporated themes of heraldry and genealogy. He also intentionally included dramatic elements, such as

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using candles instead of oil lamps in the belief the former were more theatrical.91 Also like Walpole, Beckford did not limit his furnishings and collections to those that were Gothic in nature, but also included French furnishings and decorative arts of the 17th and 18th centuries.92 A fair number of similarities can be found between Walpole and Beckford.

Other Gothic interiors of the period incorporated the same type of furniture that was used by Walpole and Beckford. This furniture included both new pieces designed with Gothic motifs and old pieces which were assumed to be medieval. Most pieces were ebonized or of ebony. At Abbotsford, Sir Walter Scott (1771-1832) used a mix of “ancient” furniture and new pieces which he commissioned in a Gothic style and which were ebony or ebonized. Furniture with Gothic elements had become fashionable in the mid-18th century and so new pieces were readily available. Examples of this furniture can be found in Chippendale’s The Gentleman & Cabinetmaker’s Director. Older pieces of furniture used in Gothic Revival interiors were often pieces from the 17th century and not the 15th and 16th centuries as their owners believed. Examples of these pieces are the 17th-century “Wolsey” chairs that Walpole used in several rooms at Strawberry Hill. William Beckford had these chairs at Fonthill Abbey and they were also used at Esher Place (Figure 14).93 Peter Thornton noted that the use of these chairs, “set the pattern for such antiquarian exercise in interior decoration for three-quarters of a century because all the arrangements at Strawberry Hill were so widely publicized.”94

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92 Ibid., 140.

93 The Wolsey chairs were probably acquired by William Kent (1685-1748) during the restoration of the house c.1730. Comforth, Early Georgian Interiors, 234; Wainwright, The Romantic Interior: The British Collector at Home, 1750-1850, 131-32.

All of these Gothic Revival interiors incorporated references to family history and past glories. At Lee Priory, designed by James Wyatt and constructed in the 1780s, the furnishings were, “marked by fidelity to the letter and spirit of antique precedents.”

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addition to references to an ancient past, there is also a consistency in the style of furnishings used by Walpole, Beckford, Scott and others. But where Walpole differs from these other practitioners of the Gothic is in his arrangement of rooms to intentionally represent the passage of time from ancient past to recent past to present. This can be seen in the Great North Bedchamber and other rooms at Strawberry Hill where Walpole purposefully added elements from his father’s generation to create a space that appeared to be not from the 15th century or from the mid-18th century, but from the 15th to mid-18th centuries. Where other Gothic interiors used medieval elements in an attempt at authenticity to a specific period of time, Walpole used Gothic as a prop in his designs which were created for atmosphere, mood, and show.

3.3 Damer and Waldegrave Family (1797-1846)

3.3.1 Description and Alterations

The appearance of the room while under the ownership of the Waldegrave family prior to the sale of the contents of Strawberry Hill in 1842 can be ascertained through visitor accounts and records from the sale itself. In 1826, Sydney Owenson, Lady Morgan, in her article for New Monthly Magazine, described the Great North Bedchamber as, “en grand tenue [a grand affair], according to the old style of magnificence.”96 She noted the presence of walls of crimson damask and that the “royal canopied bed [was] plumed with ostrich feathers, and hung with rich tapestry of Aubusson, surrounded by a carpet of curious needlework, and flanked by chairs of ebony and gold, too heavy to move, and too fine to sit in,” that were all features retained from Walpole’s period.97

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97 Ibid.
Further proof the physical fabric of the room and its furnishings changed very little from Walpole’s time comes from *A Catalogue of the Classic Contents of Strawberry Hill Collected by Horace Walpole (1842 Catalog)*. The room is described as, “filled...with pictures, antiquities, and objets of *virtu*,” as most of the furnishings, portraits and objects included in Walpole’s *Description* still remained. The curtains and window cornices illustrated in the 1784 Carter view are described in the *1842 Catalog* as a, “pair of rich crimson silk and worsted damask falling window curtains, with elegant carved and gilt cornices of scroll work, with enriched border.” Conspicuous is the absence of the elaborate state bed, whose hangings and quilt were listed in the “japanned cabinet in Gallery” described as, “a magnificent suite of hangings for a state bed, of very fine old Aubusson tapestry, lined with rich crimson silk, crimson silk curtains, pillow cases, &c., altogether 23 pieces” and “a splendid large Aubusson tapestry quilt.” In place of the bed, several quadrille tables were noted, including a “solid” pair and one of “old India Japan.”

Almost everything in the Great North Bedchamber described in the *1842 Catalog* sold during the sale, with the exception of the stained glass window in the exterior wall of the glazed closet. As a result of the sale, the appearance of the room changed

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99 Ibid., xvi.

100 Ibid., 161.

101 Lots 89 and 90 of the seventeenth day of the sale. The hangings represented the only part of the bed of any worth as the bedstead, meant to be concealed by bed curtains and valances, was most likely very plainly constructed and not of value aesthetically. The flying tester, too, would have been undesirable as by the mid-19th century, it would have been considered extremely out of date. Ibid., 176.

102 Oxford English Dictionary describes quadrille as a “card-game played by four persons with forty cards, the eights, nines, and tens of the ordinary pack being discarded,” and notes that the game replaced “ombre as the fashionable card game about 1726, and was in turn superseded by whist.” Ibid., 163.

103 While the painted glass in the two bay windows was listed as sold in the 1842 sale, Michael Peover in his 1995 article, “Strawberry Hill, Middlesex,” notes that the, “complete set [of glass] made for the
dramatically. All furniture and portraits were removed, as well as architectural elements such as the chimney-piece bust of Francois II, the medallion of Anne of Bretagne, and the medallions above both doors.

3.3.2 Function

The presence of multiple quadrille tables listed in the 1842 Catalog suggest that under the ownership of the Waldegrave family, the room apparently continued to be used as a place for entertaining until the house was abandoned in 1842.

3.4 Lady Waldegrave’s Drawing Room (1846-1879)

3.4.1 Description and Alterations

In 1856, after a 14 year absence, Lady Waldegrave returned to Strawberry Hill to restore and renovate the house. While her alterations to other rooms have been documented, no written descriptions or pictorial evidence of what she did in the Great North Bedchamber has yet been located. It is known that she added new wall coverings to other rooms in the house, so it is highly likely that she updated Walpole’s damask wall coverings at this time, which would have been more than 80 years old. Under the existing green wallpaper, an earlier paper was found. This paper features thin, gray, vertical stripes on a white ground, overlaid with a vibrant, colorful floral pattern that also includes a woven basket detail. While only a portion of the pattern was visible, it appears to be consistent with other naturalistic floral patterns of the mid-19th century.
and may have been introduced to the room by Lady Waldegrave during her 1856 remodel of the space.\textsuperscript{105}

The production of this floral paper may have involved both machine and block printing. Beginning in the 1820s, colored grounds and stripes began to be mechanized as manufacturers looked for ways of increasing output and reducing costs.\textsuperscript{106} Stripes could be printed better by machine, while the floral pattern continued to be hand blocked, and would therefore have been expensive. Naturalistic floral motifs were fashionable in mid-19\textsuperscript{th} century wallpaper. The papers incorporated “realistic” depictions of flowers, particularly of roses and often included the latest hybrids. These flowers were rendered in their most perfect form, in full bloom and in a wide array of color. The Great North Bedchamber paper is very similar to a Desfossé et Karth paper of c.1850 by Charles Muller illustrated in Catherine Lynn, \textit{Wallpapers in America} (1980), (Figure 15).\textsuperscript{107}

Lady Waldegrave was probably responsible for selecting the pink, green and white tiles currently within the fire box. The tiles feature white circles superimposed over a Moorish star, on a background of pink with a tri-leaf design in green. The design motif would have complimented the Gothic elements within the room, while the contrasting color scheme, typical of the period, would have coordinated with the predominant colors of the wallpaper (Figures 16 and 17). Along with the addition of the tiles, it is likely that

\textsuperscript{105} Refer to Figure 29, in E.A. Entwisle’s \textit{Wallpapers of the Victorian Era}, a c.1860 paper which also features a striped ground and floral motif.

\textsuperscript{106} Catherine Lynn, \textit{Wallpapers in America from the Seventeenth Century to World War I} (New York: W.W. Norton & Co. for the Barra Foundation, 1980), 305.

\textsuperscript{107} The Desfossé et Karth paper includes the caption, “Still available in 1913, it was called by George Leland Hunter in \textit{Home Furnishing} the best “roses” paper in the world.” The paper appears to be very similar to that in the Great North Bedchamber, as it also includes a woven basket element interspersed with a floral motif. However, the coloring of the paper is limited to reds, pinks, and green and the ground is a solid off-white, in contrast to the variety of colors and striped ground found on the paper from the Great North Bedchamber. Ibid., Fig. 15-5, 333.
Figure 15: Naturalistic floral wallpaper with woven basket element (Catherine Lynn, *Wallpaper in America*, Figure 15-5)
Figure 16: Sample of floral wallpaper found under architrave detail on west wall, south entrance door, view west, 2005 (J. Donofrio, S. Thorp)
at this time the current fire back was installed, as Walpole’s fire back, featuring King William III on horseback, had been sold during the 1842 sale.

The catalog accompanying the 1883 sale of the contents of Strawberry Hill provides some insight into the evolution of the room under Lady Waldegrave’s residency. The inventory includes two pairs of “Aubusson tapestry window curtains with velvet borders, lined and bound with silk cords.” The floor was covered wall-to-wall with crimson Brussels carpet that was probably patterned, possibly in various shades of red. The patterns of Brussels carpets were typically limited to five colors. They were woven in 27 inch strips and seamed together to form one large carpet.

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The Great North Bedchamber contained numerous card and occasional tables, as well as a “gilt frame drawing room suite, richly upholstered in crimson satin damask,” including an ottoman, three easy chairs, and a lady’s chair.\textsuperscript{109} Reminiscent of the room’s original appearance, there were also twelve, “Gothic pattern oak frame chairs with cane seats.”\textsuperscript{110} A “carved and gilt étagère with plate glass panels” held an abundance of figurines and dishware.\textsuperscript{111}

It is likely that the east entrance was created at this time in order to dispense with the circuitous route to the room that Walpole had designed. As originally planned, access to the Great North Bedchamber from the main block of the house required that one travel past the Holbein Chamber, through the Long Gallery and then double-back past the Tribune before reaching the room. By creating a door in the east wall, the room could easily be accessed directly from the hall that extends from the Star Chamber to the Long Gallery. Based on the organization of the 1883 catalog, the inventory flows from the Great North Bedchamber directly to the “Star Chamber, Passage, &c.,” which would be consistent with the presence of a door on the east wall. The inventory for the Star Chamber and Passage includes the same carpet as described in the Great North Bedchamber, which reinforces the idea of the spaces flowing together. With the introduction of a new east door, the glazed closet door was moved from its original location on the west wall to the new east entrance and the glazing replaced with solid panels. This re-use of the existing door served to maintain the balance and symmetry of

\textsuperscript{109} Ibid.
\textsuperscript{110} Ibid.
\textsuperscript{111} Ibid.
the room. On the glazed closet, the current rectangular glazed closet door was installed.\footnote{Based on physical investigation of the room conducted in July 2005, it appears that the original glazed closet door leaf featured a lancet arched form and an architrave identical to the existing west entrance door.}

### 3.4.2 Function

Under Lady Waldegrave’s ownership, the room probably continued to be used as a space for entertaining. While an article from *The Sketch* refers to the room as “Lady Waldegrave’s bedroom,” this use for the room seems unlikely.\footnote{Leonard Willoughby, "Household Gods: Sir Herbert Stern, Bt. - Strawberry Hill, Twickenham," *The Sketch*, no. November 29 (1905): 212.} The type of furniture inventoried in the 1883 sale following Lady Waldegrave’s death included numerous card tables and a gilt drawing room suite but the notable absence of a bed.

### 3.4.3 Design Intent

The room which Lady Waldegrave created included finishes and furnishings which were very fashionable for the mid-19th century. Gothic designs remained in vogue and so her use of Gothic chairs and tiles, as well as her retention of existing Gothic details, would reflect taste of the time. She consciously did not Gothicize the room any more than Walpole had, but instead used what was available, tasteful, and of high quality. The introduction of a floral wallpaper into the room brought a feminine character that was considered appropriate for a drawing room of the mid-19th century. Unlike Walpole, Lady Waldegrave’s room was not intended to reflect layers of history; it was created to reflect taste and status.

Was Lady Waldegrave intentionally playing the role of preservationist at Strawberry Hill? It is difficult to say based on the limited amount of information available on her and her time at Strawberry Hill. That Gothic was still in vogue (though a more
muscular Pugin version) when she was restoring Strawberry Hill and that the house was well-known as a Gothic centerpiece may have greatly influenced her decision to follow Walpole’s original design intent. In her own wing, Lady Waldegrave continued to use a Gothic vocabulary, but her addition was designed primarily to accommodate her needs. On a small-scale, she added details such as more ornamented “Gothic” versions of hardware and other decorative embellishments, which served to tastefully “update” the house. However, on a large-scale, she did not attempt to add more frivolous or less utilitarian Gothic rooms such as cloisters and chapels as Walpole and others intentionally practicing in the earlier Gothic Revival had done. Instead she added rooms typical of the period, such as the billiard room, which had become a commonplace feature by the mid-19th century. Through her marriages, Lady Waldegrave had acquired several residences, all of which she expanded and enlarged in some way to suit her needs. Strawberry Hill may have been one of her earliest projects, but it was not the only, and it fits her general pattern of remodeling and adaptive use to suit her requirements as a political hostess.

The press of the period gave Lady Waldegrave credit for her role in restoring the splendor of Strawberry Hill. In 1879, her obituary noted that she did, “fitting honor to the memory of Horace Walpole by restoring the villa at Strawberry Hill, which was his creation and delight, to its original luster and prestige, by making it one of the most agreeable country houses in England, and by greatly augmenting its resources.” 114 Other contemporary reviews followed this theme of praise. However later scholarly works on the Gothic Revival and on Strawberry Hill mention her changes to the house only briefly and rarely credit her for saving the house from complete deterioration.

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114 “Death of a Famous Society Leader,” 2.
3.5 Stern Family (1879-1923)

3.5.1 Description and Alterations

No written record or image of the Great North Bedchamber during the Stern family's ownership was located, except a 1905 article that included a photograph of the glazed closet.\(^{115}\) The catalog from the 1923 sale of the contents of Strawberry Hill might provide some insight, but this rare book was not available to this researcher.

Redecoration of interiors is often tied to changes in ownership, and based on stylistic precedence, the Stern family may be responsible for the existing green and gold flocked wallpaper. Flocked wallpapers date to the late 17\(^{th}\) century, designed as a substitute for cut velvet.\(^{116}\) Flock was made from chopped wool, although there are occasional references to the use of silk. As Robert Dossie in his *Handmaid to the Arts* explains,

> the paper designed for receiving the flock is generally first prepared with a varnish ground; for as the flock itself requires to be laid on with varnish, the other kind of ground (distemper) would prevent it from taking on the paper; and render the cohesion so imperfect that the flock would peel off with the least violence.\(^{117}\)

A.W.N. Pugin advocated the use of flocking in papers of Gothic design considering them, “admirable substitutes for ancient hangings.”\(^{118}\) The popularity of flocking began to decline in the late 19\(^{th}\) century, partly due to a change in public opinion regarding hygiene and cleanliness, as flocked paper was thought to attract and hold dust and was difficult to clean.\(^{119}\)

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\(^{118}\) Saunders, *Wallpaper in Interior Decoration*, 60.

\(^{119}\) Ibid.
The existing green flocked paper has a stylized Gothic pattern and subtle coloring consistent with late 19th-century tastes, corresponding to the period of ownership of the Stern family. The exchange of Lady Waldegrave’s realistic flowers for stylized Gothicism reflects the shift in fashionable English wallpaper design that occurred during the last quarter of the 19th century. English critics in particular regarded realistic designs as bad taste. In protest, design reformers such as Christopher Dresser (1834-1904) and Owen Jones (1809-1874), advocated stylized, two-dimensional “flat” papers as appropriate for flat walls. These reformers were followed by John Ruskin (1819-1900), William Morris (1834-1896), and Charles Locke Eastlake (1836-1906), who targeted mass production as the source of great quantities of poor design. Their reaction to three-dimensional ornamentation, specifically floral and architectural motifs, was to encourage geometric and stylized designs that often incorporated Moorish and Gothic, and later Japanese, influences. The attenuated qualities of the design of the green flocked wallpaper places it within the context of these later patterns, as does the darker, more subdued coloring, and the use of a single overall color highlighted with gold.120

Other alterations in the room include removal of the stained glass window in the north wall of the glazed closet, which based on photographic documentation, occurred sometime after 1905, possibly while the Stern family owned the house.121

120 Personal interview with John Buscemi, Classic Revivals, March 27, 2006; Lynn, Wallpapers in America from the Seventeenth Century to World War I, 428-29.
3.5.2 Function

It is not known how the room was used by the Stern family; however an early 20th century photograph indicates that the glazed closet continued to be used to display objects (Figure 18).\textsuperscript{122}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{glazed_closet}
\caption{Glazed closet, note stained glass window at right, view west, 1905 (The Sketch, 212)}
\end{figure}

\textsuperscript{122} Ibid.
3.6 Saint Mary’s College (1923-present)

3.6.1 Description (2005)

Today the walls of the Great North Bedchamber are still hung with full-length panels of green and gold flocked wallpaper in a stylized Gothic pattern, which is backed by a plain paper lining, a second floral wallpaper with a plain paper lining and hessian or coarse linen used as a support. The paper is tacked at the sides and at the top of the wall with a gold “rope” fillet running along the seam between wall and ceiling. The ceiling retains its original geometrical star pattern of gold ribbing and drop pendants on a white ground. The room features a baseboard of white and gold and an exposed wood floor that has a dark finish around the perimeter but is unfinished in the center of the room, suggesting it was covered by a carpet. Entrances to the room are located on the east and west walls (Figures 19-24).

In the center of the south wall is the projecting fireplace with the original carved Portland limestone mantelpiece painted white and gold and fireplace surround of black and old marble. The pink, green and white tiles of Lady Waldegrave remain within the fire box. Above the fireplace opening is a central ogee arch flanked by two crocketed pinnacles. On the east portion of the south wall, the wallpaper has been removed from the lower half of the wall to expose frame and panel construction and a hole through which a painted trompe l’oeil window and the pebble dash of the former exterior wall of the earlier portion of the house can be seen.

On the east wall, at the south end, is a lancet arched door with gold tracery on a field of white. The architrave features a prominent central ogee arch, topped by a poppyhead in a floral form, and flanked by crocketed pinnacles. The east wall retains full-length wallpaper panels.
Figure 19:  Great North Bedchamber, view east, 2005 (J. Donofrio, S. Thorp)

Figure 20:  Great North Bedchamber, view west, 2005
Figure 21: Great North Bedchamber, view northwest, 2005 (J. Donofrio, S. Thorp)

Figure 22: Great North Bedchamber, note missing wallpaper and opening with view of pebble stone exterior (left), view southwest, 2005 (J. Donofrio, S. Thorp)
Figure 23: Trompe l’œil window on former exterior wall of Long Gallery, view east, 2005 (J. Donofrio, S. Thorp)
Figure 24: Fireplace, view south, 2005
On the north elevation are two projecting, multi-light bay windows with original painted and colored glass in the form of heraldic shields in the upper lights. Within the bays are a raised floor and a surbase of panels covered with gold tracery incorporating Gothic quatrefoils. At each bay is a pair of pocket shutters that are set into the wall of the room. Contemporary heaters are located at the east and west ends of the wall, flanking the window bays.

The west wall features two entrances, one at the south end and one at the north end. The original south door mirrors the later south door on the east wall and features identical tracery and architrave. The later, north door is rectangular with a single, large, glazed upper light and lower tracery-covered panels (Figure 25). This door leads to the small display closet which is painted light green and contains four fixed shelves which are partially covered with red velvet (Figure 26). A lancet arched window with mottled glass is located in the north wall of the closet and the floor is exposed wood boards.

3.6.2 Function

Following the purchase of the house by Saint Mary’s College in 1923, it appears that the room was not used extensively. The Reverend William Cole noted during his visit to the house in 1947, “the Fathers like not to lye [sic] in Mr. Walpole ['s] great Bedchamber because of its Vastness and Coldness.” Architectural plans from the 1960s and 1980s label the room as a community oratory or chapel. Currently the room is unused.

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Figure 25: Rectangular glazed closet door, view west, 2005 (J. Donofrio, S. Thorp)
Figure 26: Glazed closet interior, note fixed shelves, red velvet and replaced exterior window, view west, 2005 (J. Donofrio, S. Thorp)
4.0 Examination and Analysis

To supplement and confirm or refute conclusions made based on archival research, laboratory analysis of finish materials is often employed. The following sections will consider testing methods that are generally used to analyze paint, wallpapers and textiles to determine both relative and absolute dates based on style, technology (material and fabrication techniques) and stratigraphy. This is followed by a description of specific analytical methods used in this report.

4.1 Testing Methods

Paint, wallpaper and textiles have been employed in interior design most obviously for their decorative qualities. While these materials may also serve other functions, such as providing a protective coating, it is their aesthetic contribution that is often considered first and foremost. Because of this, analysis of historic paint, wallpaper and textiles is primarily focused on discerning the original appearance of the material. Analysis is also used to aid in dating a material in order to determine a chronology or decorative history of a space.

4.1.1 Paint

Paint analysis looks specifically at the sequence, color and composition of paint layers. Historically analysis was done in situ by mechanical removal to reveal earlier layers of paint. This technique can provide a general idea of earlier painting campaigns, but subtle variations including the use of graining and gilding can easily be overlooked. Due to the nature of some paints, for example oil paints that take on a yellowish tint when covered over, scraping may also lead to incorrect assumptions regarding color.
A process of taking samples for study not in situ but in a laboratory is now a standard procedure. This process involves the use of small samples that incorporate the existing design layer stratigraphy as well as the substrate, where possible, which are then embedded in various media and cut to form cross sections. The cross section can be studied under a stereomicroscope, using magnification from 10x-150x. This allows for subtleties in the stratigraphy, which may not be visible in scrapes, to be identified.

In addition to examining stratigraphy, microscopic study under reflected light can be augmented by the use of polarized and ultraviolet light to aid in the identification of pigments and binders within a particular paint layer. McCrone notes that size, shape, refractive indices and observation using polarized light microscopy (PLM), can be used to compare an unknown pigment with known reference standards and outlines analytical schemes that can facilitate identification. Gettens and Stout outline specific micro-chemical tests and sequential testing steps to identify unknown pigments. More recently, micro-chemical tests have been supplemented by the use of more sophisticated instrumental analysis such as X-ray diffraction (XRD), which can be used to identify organic pigments. Scanning electron microscopy (SEM) is employed to examine cross sections at high magnification and is often used in conjunction with energy-dispersive x-ray spectrometry (EDS), which can identify elemental components of pigments. Fourier transform infrared microspectroscopy (FTIR) can be used to produce spectra of individual pigments, which can then be compared against reference spectra for identification.


Identification of media is a less certain procedure than pigment identification. Analysis incorporates micro-chemical and staining tests, used in conjunction with PLM and fluorescence microscopy to discern the presence of glue, egg tempera, oil or oil/resin mixtures. These tests are now being supplemented with instrumental analysis such as gas-liquid chromatography (GLC), gas chromatography-mass spectrography (GC-MS), and high-performance liquid chromatography (HPLC), which can provide more accurate identification of binders.

4.1.2 Wallpaper

Because wallpaper is essentially paint on paper, wallpaper analysis is an interesting crossover field, which draws from and incorporates analytical techniques from both established conservation areas, that of paint and paper. Analysis can be subdivided into the examination of the pigment, binder and paper substrate that comprise wallpaper. Analysis of wallpaper can take many forms, from straightforward physical examination to more technologically advanced methods which rely on the assistance of analytical instruments. The recommended approach is a combination of techniques – observation with the naked eye and analysis using a range of instrumentation.

Critical to the analysis of wallpaper is a general understanding of materials and processes used in wallpaper production and how these processes have evolved over time. With wallpaper especially, changes in manufacture technology and the composition of materials used can be directly linked to specific periods in time, therefore aiding in the development of a timeframe and understanding of the context of a specific

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piece of historic wallpaper. Physical examination can fairly easily reveal information regarding printing technique and paper composition. Evidence of the paper substrate in the form of sheets or rolls will place the wallpaper roughly within the hand-made, pre-1835 category or machine-made, post-1835 category. If a large enough sample is not available to determine overall paper configuration, fiber orientation can be used to establish if the paper is hand or machine made. Hand made papers will have multi-directional fibers and will tear in a jagged line, where machine made fibers will have a regular, vertical arrangement and will tear in a neat line. The width of the paper may also give some indication as to its date and its country of origin. The color of the paper and its flexibility will indicate whether the paper has a high rag or wood pulp content, placing it before or after the mid- to late-19th century. Rag fiber paper will be fairly bright white and flexible, where paper containing a high amount of wood pulp will show characteristic browning and brittleness from acids in the wood pulp.

Examination of the printed design and ground can provide further insight into the manufacture method for particular wallpaper. Hand block printed paper will have fairly thick paint and small holes from bubbles visible in portions of the solid areas of color. Paper printed using an automated roller process will appear very thin and have a distinctive darker outline and lighter inner color resulting from the release of pigment from the roller. There is also a streaky appearance that corresponds to the direction that the paper was moving during printing. The distinction between hand blocked and roller printing will give a date corresponding roughly to pre- or post-1840s. Paper printed using the 20th century method of silk screening can be identified based on the presence of a screen pattern, usually visible along the edge of the printed design.

Information gathered as part of this first initial step of physical examination can be used to help inform further analysis of the composition of the paper substrate,
ground, and paint used to produce the design layers, and the adhesive used to attach the paper to the wall. Methods of further examination can include the use of optical and electron microscopy, spectroscopy, micro-chemical spot testing, and fiber staining.

Paper fibers can be analyzed using microscopy. This more detailed analysis can serve to reinforce or clarify information gathered during the initial physical examination. Fiber staining is used to distinguish between types of fibers, such as wood and rag, and can possibly indicate the paper pulping process used and therefore provide some parameters regarding the date of the paper. In her master’s thesis on wallpaper analysis, Andrea Gilmore recommends the use of both microscopic examination and chemical testing for paper fibers.\footnote{130 Andrea M. Gilmore, "Wallpaper Conservation for the Architectural Conservator - a Discussion of the Problems Involved and a Methodology for Analysis and Treatment" (Master of Science, Columbia University, 1979), 81.}

PLM can be used to examine the optical properties of pigments and binders through dispersions and cross-sections, and is described by Frank Welsh in his article on the investigation and analysis of wallpaper as the most useful tool for analysis of pigments and binders.\footnote{131 Frank S. Welsh and Welsh Color Conservation Inc, "Investigation, Analysis, and Authentication of Historic Wallpaper Fragments," \textit{Journal of the American Institute for Conservation} 43, no. 1 (2004): 101.} Micro-chemical spot testing can be used to identify pigments and binders, as well as glues and starches used as adhesives, based on their reaction to acids, alkalis and other reagents. Energy dispersive x-ray fluorescence (XRF) is becoming more popular as a method of analysis for pigments and grounds. XRF can be used to gain information on the elemental composition of pigments, particularly the presence of heavy metals. Other methods used in wallpaper analysis include Raman spectroscopy and microscopy, FTIR, fluorescence microscopy, SEM, and EDS.
4.1.3 Textiles

Textile analysis considers the type of fiber used to produce the textile and the dye used to color it. Fibers are first generally classified as animal, vegetable or synthetic. Traditional identification methods have employed ignition, solubility and twist tests to discern the origin of the fiber. Microscopic examination of cross and longitudinal sections using transmitted and polarized light can be compared to references in fiber atlases and used to further categorize the fiber. More recently, FTIR has been used to understand the chemical composition and physical structure. FTIR has the advantage over traditional fiber identification methods in that it requires a relatively small sample that can be easily prepared for analysis.

Identification of historic dyestuff involves visual examination and comparison with known standards. This method is supplemented by extraction techniques that employ a test sequence of increasingly stronger solutions and heat to determine the character of the dye. Extracted dyes are then analyzed using ultraviolet/visual spectrophotometry. A fairly large textile sample is required for this process which is time consuming to complete and results in the destruction of the fiber as well as some of the dyes. Other analytical techniques include thin layer chromatography and HPLC. More recently, FTIR has been used to identify dyes and mordants based on pre-existing libraries of

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135 Ibid.
spectra. According to Gillard et al., FTIR requires only a small sample, and is a fast, non-destructive method for dye analysis.

4.2 Methodology

4.2.1 In situ Examination

In order to understand what finishes from existing and past decorative schemes remain within the Great North Bedchamber, *in situ* investigation of the room was conducted in July 2005. Examination included assessment of the existing painted finishes, as well as investigation of wallpaper stratigraphy and textile remnants. At this time, small samples of painted finishes, wallpaper, and textiles were removed from woodwork, doors, windows, walls, and ceiling for further analysis.

On the Portland stone mantel-piece, the limestone substrate prohibited the removal of samples for further laboratory analysis. Instead, *in situ* examination included mechanical removal of paint layers to reveal earlier decorative schemes. Removal was done using a scalpel. This was a gross examination of the paint stratigraphy, and while it did not provide comprehensive information about individual paint layers, it did give some general information about changes to the finish schemes over time. Mechanical removal techniques were also used on the west entrance door. This information supplements instrumental analysis completed off-site on extracted samples.

4.2.2 Laboratory Analysis

Further analysis was conducted off-site on extracted samples. The majority of this analysis was completed at the Architectural Conservation Laboratory at the

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138 Ibid., 191.
University of Pennsylvania (ACL). Optical microscopy was done using a Leica MZ16 stereo microscope for gross sample examination and a Nikon Optiphot 2-Pol compound microscope with polarizing head for detailed sample examination. Instrumental analysis included microscopic FTIR (M-FTIR), in which a Thermo-Nicolet Nexus 670 with Thermo-Nicolet Continuum microscope was used. M-FTIR analysis was completed at the Philadelphia Museum of Art (PMA). EDS examination used an accelerating voltage of 20keV and was conducted at both the PMA and the Laboratory for Research on the Structure of Matter (LRSM) at the University of Pennsylvania.

4.2.2.1 Paint

Forty representative paint samples were extracted from the Great North Bedchamber from a variety of features including doors, woodwork, and ornamentation. Sampled features were selected with the intention of gaining a broad understanding of changes to the space, while limiting damage to historic fabric. Removal was done using a scalpel to carefully extract a sample ranging from 0.25 – 1 cm², taking particular care to include all paint layers as well as substrate. Of the samples that were taken, 31 were selected for cross sectional examination based on completeness of represented stratigraphy and presence of substrate (refer to Appendices 1 and 2 for sample locations and results of cross section examination). The selected samples were embedded in Bio-Plastic™ resin using plastic trays which yielded a cube of approximately one cm². The cubes were sectioned using a Beuhler Isomet micro saw. The sectioned samples were then polished using a felt pad and Beuhler Micropolish II 0.05 micron alumina powder.

The polished samples were mounted on clean glass slides with cyanoacrylate so that the cross sections were visible, and then viewed under reflected light. A magnification of 100x was used for initial stratigraphic analysis and to develop a
stratigraphic description. As part of the microscopic analysis, select cross sections were
color-matched under daylight-balanced reflected light to Munsell color chips from the
Glossy Collection. Munsell color chips provide a color standard and a method for
identifying and organizing colors.

Solubility testing was conducted on two samples using de-ionized water and
acetone to determine if the represented features had been gilded using water or oil
gilding. Each reagent was applied with a cotton swab and minimal abrasive rubbing.
Solubility in water is an indication of water gilding.

Three representative cross section samples and one pigment sample were
further analyzed using EDS to obtain elemental information. Cross sections were
sanded to reduce the amount of resin surrounding the section, which has a potential to
interfere with the analysis, and then placed on pucks covered with carbon tape. The
pigment sample was removed from the gross sample and prepared in a similar manner
on a puck covered with carbon tape. All pucks were then carbon coated and analyzed.
On the cross sections, digital maps were created which showed elemental composition
and distribution. On the pigment sample, a spectrum was generated which illustrated
elemental composition. Laboratory analysis was conducted at the LRSM and at the
PMA.

4.2.2.2 Wallpaper

Samples of two wallpapers were removed from the north side of the glazed
closet door of the Great North Bedchamber for further analysis off-site. Sample W.01 is
a piece of the upper paper which features flocking on a green ground with stylized gothic
elements picked out in gold. It is approximately 2”x5” and features a small portion of the
overall pattern of green and gold with flocking (refer to Appendix 3 for results of
wallpaper analysis). The paper substrate of the sample appears fairly white and flexible – it did not crack or break on bending. The sample is backed with a paper lining that has similar characteristics of brightness and flexibility. Sample W.02 consists of pieces of the second wallpaper which was found under the existing green paper. This paper features a multi-color floral pattern with a woven basket element on a striped, white ground and includes at least a dozen different colors. The sample is composed of three individual pieces ranging in size from approximately 1”x2” to 1”x3”. The design on these pieces represents only a small portion of the overall pattern and includes ten of at least twelve colors that were used in the complete pattern. These pieces have a paper substrate that is fairly white and somewhat flexible as it did not crack or break on bending. All the pieces are backed with a plain paper lining which also has similar characteristics to the paper substrate.

Both samples were examined at 100x magnification under reflected light. Further analysis of pigments and binding media was completed using M-FTIR and EDS. Samples of each paint color on the wallpaper were removed and rolled or pressed onto a diamond cell and then examined using M-FTIR to understand the composition of the sample. Further compositional analysis was completed using EDS. A sample of each paint color was placed on carbon-taped pucks as described above and carbon coated. The samples were examined to obtain spectra of elemental composition. Both M-FTIR and EDS analysis was conducted at the PMA.

A dispersion of one color sample was created for further examination using polarized light microscopy. To create the dispersion, a tungsten needle was used to carefully remove the selected color, which was placed on a clean glass slide. The color was then crushed with a rotation motion between the slide and a clean cover slip. The dispersed particles were then transferred with a fine brush to a slide prepared with a
small amount of Melt Mount. A cover slip was placed over the particles and Melt Mount, which was re-heated to integrate and secure the color particles. The prepared slide was viewed under polarized light at magnifications of 100x-400x.

Paper fiber analysis was undertaken following methods outlined in Andrea Gilmore’s thesis *Wallpaper Conservation for the Architectural Conservator* and described in further detail in B.L. Browning’s *Analysis of Paper*. A small, roughly 1cm² sample of paper was torn into small pieces and placed within a 30 mL beaker and covered with approximately 15 mL of a 0.5% sodium hydroxide solution. The solution was brought to a boil and then decanted. The paper sample was then rinsed twice with de-ionized water. Following rinsing, the sample was covered with 15mL of 0.05N hydrochloric acid and allowed to stand for two minutes. The acid solution was decanted and the sample was rinsed twice with de-ionized water. The paper was then rolled into small pellets and placed within a 500 mL Erlenmeyer flask and 250 mL of de-ionized water was added. The sample and water were then shaken vigorously several times until it appeared that the paper pellets had broken down into individual fibers. The fibers and water were then transferred several times between the Erlenmeyer flask and 250 mL beaker. Finally, 125 mL of the fiber and water solution was measured into a 250 mL beaker and diluted to 250 mL with de-ionized water. A pipette was used to transfer the fibers and water to a clean glass slide, which was heated at low heat until the water evaporated. A 0.05% concentration of fibers is suggested for quantitative fiber analysis, although variances in this concentration are acceptable due to differing qualities of fibers. It is recommended that in the final slide the total count based on a traverse of five lines should contain not less than 200 fibers. Initially, preparation of the fibers resulted in too few fibers, so the testing method was modified and the last dilution step, which required adding an additional 125mL of de-ionized water to 125 mL of fiber and water.
solution, was not completed. Prepared slides were then analyzed under reflected, transmitted and polarized light using a magnification of 100x-400x.

4.2.2.3 Textiles

Two textile samples were removed from the Great North Bedchamber. Sample W.06 consists of a few red threads that were found pinned between the wallboard and a small tack on the east side of the west window bay (refer to Appendix 4 for results of textile analysis). Sample W.35 is a piece of red velvet, approximately 2”x4” that was found on the interior of the glazed closet.

Fibers from each of these samples were separated and placed on clean glass slides. The prepared samples were viewed under reflected, transmitted and polarized light at a magnification of 100x-400x. Further fiber analysis was conducted on sample W.06 at the PMA using M-FTIR. Fibers were pressed or rolled onto a diamond cell and then analyzed and composition spectra generated.
5.0 Results of Interior Finishes Examination and Analysis

5.1 Paint

5.1.1 Woodwork

5.1.1.1 In situ Investigation

Woodwork in the Great North Bedchamber is currently painted in a bicolor scheme of white and gold. The existing campaign shows signs of age, as evidenced in the ghosts of nail heads, visible through all existing layers of paint, which were found in different areas including the window bay surbase. Due to the quantity and complexity of architectural details within the room, specific elements were selected for a more detailed examination of paint layers by mechanical removal, in addition to the extraction of samples for off-site analysis. One such area was the upper right portion of the west entrance door and architrave. Removal of the existing paint layer revealed an earlier scheme which also featured white and gold. Both the existing and exposed schemes were very similar, with some small variations in color placement (Figure 27).

In situ investigation revealed changes to the glazed closet door. Over the door, a ghost or outline corresponding to the lancet arched shape of the west entrance door architrave was uncovered under the existing wallpaper (Figure 28). This discovery indicated that the existing rectangular configuration of the glazed closet door was not original and suggested that the initial configuration of door and architrave was most likely identical to the extant west entrance door and architrave.

Further investigation of ornamental elements within the room revealed that applied decorative embellishments were composed of two distinct materials – carved wood and molded composition or “compo.” Wood elements were found original to the
Figure 27: Detail of west entrance door and architrave, annotated with colors corresponding to earlier paint scheme uncovered by mechanical removal. “W” indicates earlier layer was white, “G” indicates earlier layer was gold, view west, 2005
Figure 28: Ghost of original architrave for glazed closet door, view southwest, 2005 (J. Donofrio and S. Thorp)
room, including the west entrance door. These elements, such as the small florets accenting the cusps of the door tracery (samples W.14 and W.15), appear to have been applied directly to an unpainted surface and then painted as part of an entire assembly. Both samples W.14 and W.15 show evidence of having been glued in place. Sample W.14 also appears to have been attached using a sprig, or headless nail, based on the presence of small holes on the under side of the floret and surface of the door panel.

Composition elements were found on features that were added to the room at a later date, such as the rectangular glazed closet door. These elements, which included a floret from the glazed closet door (sample W.28), appear to have been applied over a painted surface.

5.1.1.2 Laboratory analysis

Optical microscopy of the 31 prepared paint cross sections that were taken from features throughout the room, including doors, trim, and windows, suggested that at least four comprehensive painting campaigns occurred in the Great North Bedchamber. The earliest, Campaign 1, featured a dichromatic scheme of white and gold, where moldings and architectural ornaments were picked out in gold. In Campaign 1, the first layer of paint over the unfinished substrate was a thick layer of white. On select samples, this was followed by a thin resinous layer of yellow, topped with a reflective gold layer. Under optical microscopic examination of gross samples where Campaign 1 was clearly distinguishable, this reflective gold layer had characteristics consistent with gold leaf, such as wrinkles or creases, tears, straight edges, thinness, and the absence of corrosion products. In some areas, the gold layer showed cracking that corresponded to cracks in the thin yellow layer directly underneath but did not translate to fractures in the substrate. This cracking appeared to be caused by shrinkage of the yellow layer,
which would be consistent with a size and not a clay bole, and may indicate that the gold leaf was oil gilded.

Campaign 2 also featured a dichromatic scheme of white and gold. In general, features that were painted white in Campaign 1, including the background panel on the west entrance door (sample W.17) and the baseboard (sample W.08), were again painted with a thick layer of white in Campaign 2. In select cross sections taken from elements that were added to the room at a later date, specifically the glazed closet architrave (samples W.18 and W.20), a thin yellow layer and a reflective gold layer were visible over the white layer. The gold layer had similar characteristics to the gold layer in Campaign 1, and appeared to be gold leaf when examined under 50x-100x magnification. Solubility testing on sample W.19 from the cornice of the glazed closet door revealed that the gold leaf was not soluble in water, but was removed with acetone. This test indicates that the gold leaf in Campaign 2 is not water gilding. Some elements that were gold in Campaign 1, such as the west entrance architrave (samples W.12 and W.13) and decorative embellishments on the door leaf (samples W.14 and W.15), were not repainted and retained their original gold leaf in Campaign 2. Other gold elements from Campaign 1, mainly in the very detailed tracery surbase of the window bays (samples N.04, N.05, and N.14), were repainted with the single thick layer of white. To summarize, examination of gross samples and cross sections showed that the color scheme of Campaign 2 varied only slightly from Campaign 1, and was in essence an attempt to “refresh” the white elements. New gold elements were introduced on new features in the room. In most cases, gold elements from Campaign 1 were not repainted in Campaign 2, with the exception of the window bay surbase where gold elements were repainted white.
In Campaign 3, one or two layers of white were painted over those features that had white as a final layer in Campaign 2. Elements that still had exposed layers of gold from Campaigns 1 and 2 were not repainted. However, there were some inconsistencies in the cross section layers. Many of the examined samples featured a fairly thick, distinctive layer of cream. This layer was used as a reference layer for analysis of all of Campaign 3. Some cross sections did not include this cream layer, but instead had a single light gray layer followed by a single white layer or simply a single white layer without preceding gray layers. All of these samples came from the surbase of the west window bay (samples N.04, N.06 and N.08) and suggest additional repainting in areas that typically require more maintenance due to damage from light exposure.

Campaign 4 again featured a dichromatic scheme of white and gold. One or two layers of white were present on almost every sample. On features that had a final layer of gold in Campaign 1, but had been painted white in Campaigns 2 and 3, the white layers of Campaign 4 were followed by a metallic layer composed of large flakes within a dark resin. As demonstrated by an aura of green corrosion product present on several samples, this gold layer appeared to be a copper alloy, mostly likely bronze powder. On the few features that still retained exposed gold leaf from Campaigns 1 and 2, bronze powder mixed in a size was applied directly over the leaf or over a thin intervening layer of white.

To summarize, woodwork within the Great North Bedchamber consistently presented a bicolor scheme of white and gold. Campaigns 1-3 featured gilding, some of which was repainted white and some of which was not repainted after it was initially applied. In Campaign 4 almost all features were repainted with a bronze paint utilized in place of gold leaf.
EDS was used to create a map in cross section of elements in one stratigraphically complex sample from the west bay window wooden surbase (N.04). This sample was chosen because it contained the greatest number of layers and potentially included each of the campaigns. Analysis identified a thin layer with a concentration of calcium as the first layer on the sample. This was followed by several layers that showed concentrations of lead and sulfur. An intervening layer appeared to also contain some zinc. These lead layers were followed by a thick layer containing zinc and barium. The final layer contained lead and sulfur. EDS mapping was also conducted on a sample from the east entrance door (W.31). The analysis suggested that all layers present on the sample contained lead as well as sulfur. Some larger particles of barium and calcium were also present.

5.1.2 Fireplace

Mechanical removal with a scalpel revealed the original scheme of the mantelpiece as very similar to the scheme currently visible. Small variations were uncovered, where areas originally gilded were painted white and vice versa (Figure 29). Removal of later campaigns on the pedestal for the bust of Francois II revealed an inscription in Latin, “...Rex. ...Reginae Conjux ... [illegible]” or “...King, ...husband of Queen ...,” a reference to Mary, Queen of Scots, who was the wife of Francois II (Figure 30). The overpainting featured layers of white highlights of gold that appeared to be bronze powder. The use of bronzing suggests that the overpainting was completed as part of Campaign 4. Not all of the mantel-piece was repainted. Detailed examination revealed that the pinnacles on both sides of the mantel-piece appeared to have been painted only once and included gold leaf accents.
Figure 29: Fireplace detail with Campaign 4 (left) and Campaign 1 (right), based on exposures done during on-site investigation (drawing by Bhawna Dandona)
Figure 30: Detail of mantel-piece pedestal with uncovered inscription, view south, 2005 (J. Donofrio, S. Thorp)

5.1.3 Ceiling

Cross-sectional analysis of the ceiling pendant (sample C.01) revealed that the substrate was a lime or gypsum plaster. The element was painted once and featured a light pink primer layer, followed by two layers of white, a thin yellow layer, and a reflective gold layer. Optical microscopic examination indicated that the gold layer was gold leaf as it appeared to have similar characteristics to other areas of gold leaf from Campaigns 1 and 2. EDS analysis confirmed the presence of gold. Copper and zinc or
tin, which would be expected if the layer contained bronze powder, were not present in the generated spectrum. The gold leaf was not soluble in de-ionized water, but was affected by acetone.

5.1.4 Glazed Closet

In the glazed closet, red velvet was glued to the door jamb and shelves, and the walls were covered with a substance that was dry and cracked and appeared to be a glue size. The closet contained five shelves, one of which was removed during on-site examination. The wall behind the shelf was painted, indicating that the closet was painted prior to installation of the shelves. Along the facing edge of the shelves, thin bands of gold were noted (Figure 31), which had been covered by later paint campaigns and the red velvet.

Microscopic examination of the four cross sections from samples taken within the closet suggested that the walls (samples W.31, W.32, W.33) were painted a single color in each of four campaigns. The first campaign, Campaign A, was a tan layer with a pink hue, matching Munsell 10YR 7/6 yellow. Campaign B included two layers, a primer of a dark green-tan (10Y 5/2) followed by a final coat of a bright mint green (10GY 6/2). The third campaign, Campaign C, was a thin layer of gray (10BG 4/1). The final campaign, Campaign D, featured a single thick layer of a very light green (7.5GY 7/2). On sample W.30, which was taken from the closet shelf, only two campaigns were present, Campaigns A and D, however this sample may not represent the entire stratigraphy as examination in situ suggested that the missing campaigns, B and C, were present on other portions of the shelves.

EDS analysis of a sample of the gold banding from the shelf edge suggested that it was gold, most likely gold leaf. EDS was also used to create a map in section of
Figure 31: Detail of closet shelf, with gold band (left and right) visible under later layers of paint, view south, 2005

elements within sample W.31. Analysis suggested lead was present in all layers, with small particles of iron visible in the first layer and a large concentration of barium in a later layer.

5.2 Wallpaper

5.2.1 In Situ Investigation

Two wallpapers were identified during on-site investigation. Both have a plain paper lining and are layered one over the other, over a support of hessian or very coarse canvas. On-site examination indicated that the extant green wallpaper was printed on machine-made continuous roll paper, which extended from ceiling to baseboard in one complete piece and was 18 inches in width. The wallpaper was cut around existing trim
elements such as the crocketed architraves. A dark green paint was applied under this paper, at the intersection of architectural elements, to disguise inconsistencies in the application method and minimize the contrast between the dark green paper and the lighter, earlier paper.

A larger portion of the earlier floral paper represented in sample W.02 was discovered under decorative elements of the west entrance door architrave, immediately under the green wallpaper. This exposure revealed that the pattern included a woven basket element in addition to the floral details that were originally visible, but the configuration of the complete design still remains unknown. Because only a limited portion of the wallpaper was exposed, evidence concerning details of the paper substrate, including its width, length and method of paper manufacture could not be discerned.

5.2.2 Laboratory Analysis

5.2.2.1 Sample W.01

Fibers in the paper substrate of sample W.01 were analyzed microscopically under reflected, transmitted, and polarized light. The fibers were long and narrow and featured twists characteristic of cotton. The fibers exhibited birefringence when the plane of polarization was rotated, indicating anisotropy.

Further analysis of sample W.01 using M-FTIR indicated the presence of emerald green, or copper acetoarsenite, and possibly some ultramarine blue. Emerald green can be distinguished from Scheele’s green, which also contains copper and arsenic, by the presence of the acetate group in the IR spectrum. EDS analysis on the gold pigment indicated the presence of copper and zinc suggesting bronze powders or “Dutch” leaf. There was no peak in the spectrum for elemental gold.
5.2.2.2 Sample W.02

Under microscopic examination with reflected light, the painted design of sample W.02 showed thick even layers indicating that the design was likely produced by block printing. The painted surface was matte in appearance and did not appear to have a coating. Fibers within the paper substrate of sample W.02 were analyzed microscopically using reflected, transmitted and polarized light. Some fibers appear to have the long, narrow twisted characteristics of cotton. These fibers changed color when the polarizing plane was rotated.

Further examination of pigments and binders within sample W.02 included M-FTIR and EDS analysis. M-FTIR was used to analyze all colors and EDS was used to confirm this analysis or to gather more information when M-FTIR analysis was inconclusive. The results of these analyses are summarized in Table 1.

Evidence of animal glue was found in several samples. The analysis suggests that calcite or calcium carbonate was also present in most samples. The green paints were composed of different pigments. M-FTIR suggested that the light green was emerald green. In the dark green paint, M-FTIR analysis showed evidence of Prussian blue and chrome green. EDS confirmed the presence of chrome, but also suggested that copper and arsenic were in the sample. This may indicate that the dark green also has some emerald green in it. The violet and purple appeared to have ultramarine blue, but identification of the red particles in these paints using both M-FTIR and EDS was unsuccessful. In the pink and dark pink paints, the red particles also could not be identified. Three samples of the pink paint were analyzed using EDS. In one sample, there was evidence of lead, which may indicate that the pink comes from red lead. However, lead was not found in either of the other two samples that were analyzed. While M-FTIR suggested that the yellow paint was colored with chrome yellow, EDS did
Table 1: Pigments and elements within sample W.02

<table>
<thead>
<tr>
<th>Color</th>
<th>Visible particles</th>
<th>M-FTIR</th>
<th>EDS</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td></td>
<td>Calcite</td>
<td></td>
<td>Animal glue was also found</td>
</tr>
<tr>
<td>Light green</td>
<td>Bright blue</td>
<td>Emerald green</td>
<td></td>
<td>Also animal glue</td>
</tr>
<tr>
<td>Dark green</td>
<td></td>
<td>Prussian blue</td>
<td>Copper</td>
<td>EDS suggests coloring could also come from</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome green</td>
<td>Arsenic</td>
<td>emerald green</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calcite</td>
<td>Chrome</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>Red</td>
<td>Calcite</td>
<td>Lead Sulphur</td>
<td>Lead found in only one of three analyzed</td>
</tr>
<tr>
<td>Dark pink</td>
<td></td>
<td>Calcite</td>
<td></td>
<td>samples</td>
</tr>
<tr>
<td>Purple</td>
<td>Red, blue</td>
<td>Ultramarine</td>
<td></td>
<td>No results for red particles in either</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calcite</td>
<td></td>
<td>M-FTIR or EDS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Also animal glue</td>
</tr>
<tr>
<td>Violet</td>
<td>Red, blue</td>
<td>Ultramarine</td>
<td>Aluminum</td>
<td>No results for red particles in either</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calcite</td>
<td>Silicon</td>
<td>M-FTIR or EDS</td>
</tr>
<tr>
<td>Tan</td>
<td>Red, possibly blue</td>
<td>Kaolinite</td>
<td></td>
<td>Also animal glue and starch</td>
</tr>
<tr>
<td></td>
<td>and orange</td>
<td>Calcite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gypsum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
<td>Kaolinite</td>
<td>Aluminum</td>
<td>Also animal glue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gypsum</td>
<td>Silicon</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Barium</td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td>Chrome yellow</td>
<td></td>
<td>Chrome yellow not confirmed by EDS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gypsum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-protein fiber</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

not confirm the presence of chrome in the sample. The tan sample appeared to have kaolin, most likely part of an earth pigment. This was supported by the presence of aluminum and silicon in the EDS analysis.

M-FTIR can not distinguish between natural ultramarine blue made from lapis lazuli, and synthetic ultramarine blue because both of these pigments are compositionally identical. However, the two forms of ultramarine blue can be identified optically by their morphology. A dispersion of the violet paint was made so that the ultramarine blue particles within it could be examined further. Small, rounded and sub-rounded particles of blue of consistent dimension were visible. This is consistent with
synthetic ultramarine blue. Natural ultramarine blue is composed of larger, angular and sub-angular particles of varying dimension.

5.3 Textiles

On-site investigation uncovered several different textiles and textile remnants within the Great North Bedchamber. A coarse canvas was found as a backing material for the wallpaper. Some red threads were discovered attached to a small tack in the northwest corner of the room. In the glazed closet, red velvet was found covering the shelves and along the inside of the door jamb. Samples of the red threads (W.06) and velvet (W.35) were removed for further testing.

Both samples W.06 and W.35 were examined microscopically using reflected, transmitted, and polarized light, at a magnification of 100x-400x. Sample W.06 appeared to contain some fibers which exhibited scaling typical of wool. Fibers within sample W.35 exhibited the characteristic twistedness of cotton.

Further analysis of sample W.06 using M-FTIR suggested that the textile was composed of protein fibers, supporting the microscopic analysis. M-FTIR was unable to determine the type of dye used to color the fibers.
6.0 Interpretation and Discussion

6.1 Material History and Use

Once materials have been identified through examination and analysis, understanding the history and use of the material can aid in interpretation of test results. This section includes a brief discussion of the history of materials found within the Great North Bedchamber, including composition ornament, gilding, white pigments, and the synthetic pigments found on both wallpaper samples.

6.1.1 Composition Ornament

Composition is a material that was often used in architectural ornament in place of carved wood or stone. Composition is made of chalk, glue, linseed oil and resin, and when mixed is soft and pliable, and can easily be molded. On drying, it becomes firm enough to handle and flexible enough to bend around curved surfaces. When completely dry, it is very hard and rigid. Composition became popular in the last quarter of the 18th century and continued to be used throughout the 19th century and into the 20th century, when it was employed in embellishment for movie theaters.

6.1.2 Gilding

Gilding can be described as the, “surface application of metal in the form of leaf, powder applied directly to the surface, powder mixed with a binder, or other forms to approximate the effect of solid or inlaid metal.” When gold leaf is used as gilding to

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140 Ibid.

decorate wood, two methods can be employed – water gilding or oil gilding. In water gilding, the wood is coated with several layers of gesso, which are polished to remove imperfections which may translate through to the final application of leaf. If carved details have been softened by the application of successive gesso layers, the gesso is carved to bring back the detail to these features.\textsuperscript{142} A clay or “bole,” mixed with animal glue, is applied on top of the gesso layers. The bole can be white, in which case it is similar to kaolin, or colored, such as red or Armenian bole which in its natural form is ferruginous aluminum silicate.\textsuperscript{143} After application over the gesso layers, the bole is also polished and then wetted to reconstitute the glue component just prior to application of the gold leaf.\textsuperscript{144} The gold leaf is often then burnished to create a highly reflective surface.

In oil gilding, a varnish or size is applied over the wood, and is often colored yellow by the use of yellow ochre which helps to disguise areas where leaf can not be applied, such as in crevices. The size is allowed to dry until barely tacky, and then the leaf is applied. Because oil gilding does not require the extensive preparation of gesso layers, it is quicker and easier to apply and therefore less costly, though it can not easily be burnished. John Cornforth notes that oil gilding was traditionally used to decorate architectural ornament.\textsuperscript{145}

\begin{thebibliography}{99}
\bibitem{142} Valuable Secrets Concerning Arts and Trades: Or approved directions, from the best artists, ... Containing upwards of one thousand approved receipts relative to arts and trades., (London: Will. Hay, 1775), 163.
\bibitem{145} Cornforth, \textit{Early Georgian Interiors}, 122.
\end{thebibliography}
Colored glazes or varnishes can be applied on top of gold leaf to provide some color variation and also to serve as a protective coating as the leaf is very vulnerable to abrasions and depending on the alloy may also be susceptible to corrosion.\textsuperscript{146}

Copper alloy or “bronze powder” was also used as a substitute for real gold leaf to provide “gold” accents. Robert Dossie included mention of bronzing in his \textit{Handmaid to the Arts} (1758).\textsuperscript{147} The powder is composed of copper alloy flakes which traditionally were created by beating and grinding the metal to a fine powder, but since the 1860s the flakes have been made from sheet metal.\textsuperscript{148} Copper-zinc alloys (brass) are more commonly used, but in some instances a copper-tin (bronze) alloy is employed, and a variety of colors can be produced.\textsuperscript{149} The powder can be applied in two ways, as a dry powder which is dusted over a pre-applied size or it can be mixed with the size and applied as paint.\textsuperscript{150} Bronze powder tarnishes quickly and must be varnished to maintain its brilliance.\textsuperscript{151}

\textbf{6.1.3 White Paint}

White lead, or basic lead carbonate, has been used as a pigment for paints since antiquity. Because white lead was expensive, whiting was often used as a filler or extender.\textsuperscript{152} The term whiting refers to a number of white pigments which contain a

\begin{flushright}
\textsuperscript{146} Gilded Wood: Conservation and History, 73.  \\
\textsuperscript{147} Dossie, \textit{The Handmaid to the Arts}, vol. 1, 444.  \\
\textsuperscript{148} Gettens and Stout, \textit{Painting Materials: A Short Encyclopedia}, 100.  \\
\textsuperscript{149} Ibid.  \\
\textsuperscript{150} F.B. Gardner, \textit{Everybody's Paint Book} (New York: M.T. Richardson, 1888), 82.  \\
\textsuperscript{151} Peter Mactaggart and Ann Mactaggart, \textit{Practical Gilding} (Welwyn, Herts, England: Mac & Me Ltd, 1984), 55.  \\
\end{flushright}
chalk or clay base, including barytes (barium sulfate) and chalk (calcium carbonate).\textsuperscript{153} Theodore Penn notes that white lead was the most important white pigment until the introduction of zinc white, or zinc oxide, in the 19\textsuperscript{th} century.\textsuperscript{154} By the 1850s, zinc white was commercially available and became a popular alternative to white lead because it did not come with the hazards associated with lead.\textsuperscript{155} The main disadvantage of zinc white was its poor covering power. In the early 20\textsuperscript{th} century, titanium white (titanium dioxide) was introduced. Titanium white is known for its whiteness and hiding power, and can be found in use after 1920.\textsuperscript{156}

6.1.4 Wallpapers and Synthetic Pigments

Catherine Lynn, in \textit{Wallpaper in America} (1980), notes that synthetic pigments, which began to be available in the early 19\textsuperscript{th} century, were common in wallpapers by mid-century.\textsuperscript{157} These synthetic pigments include chrome yellow, chrome green, artificial ultramarine blue, and emerald green.

Chrome yellow, or lead chromate, was developed after the discovery of chromium in 1797 and became commercially available after 1818.\textsuperscript{158} Chrome green is made from chrome yellow and Prussian blue. Prussian blue was first synthesized in 1704, its method of manufacture was published in 1724 and the pigment was well known by 1750.\textsuperscript{159} Ultramarine blue can be composed of the natural pigment, which is lapis lazuli, or a synthetic version. Lapis lazuli was used as a pigment as early as the 6\textsuperscript{th} and

\begin{thebibliography}{99}
\bibitem{153} Ibid.
\bibitem{154} Ibid.: 9.
\bibitem{155} Ibid., 10.
\bibitem{157} Lynn, \textit{Wallpapers in America from the Seventeenth Century to World War I}, 317.
\bibitem{158} Gettens and Stout, \textit{Painting Materials: A Short Encyclopedia}, 106.
\bibitem{159} Ibid., 150-51.
\end{thebibliography}
7th centuries. Because the pigment was very costly, in 1824 a prize was offered for the development of an inexpensive artificial version of the pigment. The prize was awarded to J.B. Guimet in 1828, and by 1830 factories had been established to produce artificial ultramarine blue in France and Germany. Artificial ultramarine blue, “a piercing and distinctive bright blue,” was a popular color in wallpapers of the 1850s and 1860s. Emerald green, also known as Paris or Schweinfurt green, is copper acetoarsenite and was first made in 1814. The composition and manufacture methods of the pigment were proprietary until 1822, after which time the pigment was widely produced. Emerald green was used extensively in decorative household items and as a dye for clothing and food, but its wide-spread use in wallpapers did not occur until the mid-19th century. As a pigment, emerald green was available until the 1960s.

The use of arsenic-tainted products, including wallpaper, was common in Victorian England and by the 1840s and 1850s an increased awareness of the toxic nature of the substance instigated a debate that centered on whether or not its use posed health risks. Several examples of poisoning and resultant death were reported in various journals. These claims were refuted by publicized examples that presented exposure with no effect, and the debate extended to members of the medical profession, government and trades. The result was the Arsenic Act of 1851 which restricted sale of arsenic to adults and required that vendors record the identity of purchasers in a “poison

160 Ibid., 163.
161 Lynn, Wallpapers in America from the Seventeenth Century to World War I, 318.
164 Lynn, Wallpapers in America from the Seventeenth Century to World War I, 318.
165 Fiedler and Bayard, "Emerald green and Scheele's green," 225.
book,” but which did not address the potentially hazardous use of arsenic in everyday objects.¹⁶⁶

Without a clear resolution, the debate continued through the 1880s, when a more coordinated effort focused on control of the use of arsenic-based colorants.¹⁶⁷ Research completed in the 1890s showed that in humid conditions, molds living on wallpaper paste converted inorganic arsenic in the wallpaper into the toxic gaseous di- and trimethyl arsines.¹⁶⁸ Despite this discovery, new legislation controlling arsenic was not introduced. The fervor over potential arsenic poisoning had ended by the turn of the 20th century.¹⁶⁹ This may partially be attributed to changing tastes which rendered the bright green unfashionable, as well as awareness of the hazards.¹⁷⁰

6.2 Research and Testing

Combining the results of on-site investigation with archival research and laboratory analysis has provided greater insight into the evolution of the Great North Bedchamber. All of these methods of information gathering can be used to assign ownership to changes made within the room, which can then provide a framework for making decisions regarding interpretation and conservation of the space.

¹⁶⁷ Ibid., 906.
¹⁶⁹ Lynn, Wallpapers in America from the Seventeenth Century to World War I, 319.
¹⁷⁰ Bartrip, " How Green was my Valance?: Environmental Arsenic Poisoning and the Victorian Domestic Ideal," 911.
6.2.1 Paint Campaigns

The Great North Bedchamber features a simple dichromatic color scheme applied to complicated architectural details. Because of the great number of individual elements, not every feature could be sampled and analyzed. The analysis was therefore based on a representative sampling of particular elements. From the samples that were analyzed off-site, some general conclusions about the different paint campaigns can be made.

Campaign 1, the earliest painting scheme in the Great North Bedchamber, can be associated with Horace Walpole and his residency 1770-1797. The use of white and gold finishes complemented the furniture in the room, particularly the white and gold chairs of French-inspired design and the gilt picture frames. Based on the location of decorative embellishments, as well as paint stratigraphies, it appears that Walpole used carved wooden ornamentation exclusively, such as in the small florets that cover the west entrance door. Walpole incorporated oil gilding to highlight architectural features.

While Walpole did re-paint other rooms in the house during his ownership, it appears that Campaign 2 must post-date his residency as it can be directly linked to the introduction of new elements within the room which were added after the 1842 sale, namely the dutchman over the west entrance door that covered the gap left by the removal of the bronze medallion. Other features that originated with Campaign 2 include the existing rectangular glazed closet door and the east entrance door. Because these features all have similar stratigraphies and at least the medallion patch can be tied to changes made after 1842, it appears that Campaign 2 and these alterations occurred during Lady Waldegrave’s residency. The house was vacant from 1842 until Lady Waldegrave began restoration work in 1856, so it is most likely that these features, as well as Campaign 2, date from the mid-19th century. Lady Waldegrave maintained the
dichromatic scheme established by Walpole, although some gold features, particularly in the window bay surbases, were repainted white. Like Walpole, she used gold leaf to pick out architectural details, and the gilt drawing room suite and étagère she had in the room would have coordinated with this scheme. Lady Waldegrave used composition ornamentation in her alterations, such as the florets which adorn the current rectangular glazed closet door, instead of the carved wood used by Walpole.

Campaign 3 has not been dated, but the presence of zinc in some layers suggests zinc white and indicates that this campaign occurred after 1850. This would be consistent with the interpretation of the campaign as concurrent with the installation of the green flocked wallpaper, possibly in the 1880s. Campaign 3 appears to have been an attempt to freshen the appearance of the existing white paint, while retaining the existing gold leaf. Discrepancies in stratigraphy suggest that Campaign 3 may have been followed by a subsequent partial campaign in which certain features, namely the surbase in the window bays, were painted again to compensate for increased wear and exposure due to their location adjacent to windows.

Campaign 4 is also undated, but given that it is the uppermost layer, it must post-date Campaign 3 and the 1850s. The aged appearance of the existing paint suggests that Campaign 4 is not recent, but was completed sometime ago. Campaign 4 appears to be an attempt to restore painted finishes within the room, including finishes on the stone mantle-piece, to their original appearance. In areas where ornaments or moldings were missing, crude imitations were painted in bronze paint (Figure 32).

6.2.2 Wallpaper

The hessian linen support found during on-site investigation of the wallpaper was a traditional method for hanging wallpaper was used to protect the paper from mold and
water damage caused by dampness.\textsuperscript{171} A paper lining provided a further barrier against moisture and corrosion from the tacks used in hanging the paper and linen assembly.\textsuperscript{172} Because the wallpaper was not attached directly to the wall, using a backing or support also allowed imperfections in the finish of the wall surface to be disguised. This use of hessian support and lining paper was also found under wallpaper from the 1840s in the Red Drawing Room at Uppark.\textsuperscript{173}

\begin{itemize}
\item \textsuperscript{172} Allyson McDermott, "Wallpapers," \textit{Journal of Architectural Conservation} 1, (March 2005): 18.
\item \textsuperscript{173} Caverhill et al., "The Conservation of Uppark's Historic Wallpaper," 2.
\end{itemize}
Cotton fibers were found in the paper substrate from both wallpapers. These fibers are evidence that the papers were made of rag, which was considered to be the best quality of paper over products that used wood pulp, straw and other cheaper ingredients.\textsuperscript{174} Both wallpaper samples also contained animal glue, as found in M-FTIR analysis of the paint. The presence of this glue suggests that the paint used was distemper, which is composed of pigments in an aqueous vehicle with a glue binder. Distemper paint has a very matte appearance and was commonly used on block-printed wallpapers.

Because the floral wallpaper was found underneath the existing green flocked paper, it is part of an earlier scheme in the decorative chronology of the room. The presence of certain pigments within the painted design of a wallpaper can provide some guidance as to the date of the paper. In the floral wallpaper, chrome yellow, ultramarine blue, Prussian blue, chrome green, emerald green, as well as earth pigments such as kaolinite were found using M-FTIR and EDS.

Of the identified pigments, the use of artificial ultramarine blue would suggest a date for the wallpaper of post-1830 and possibly even 1850s-1860s given the popularity of the pigment in wallpapers during from that period. This would establish a strong link between the floral wallpaper and Lady Waldegrave’s restoration of Strawberry Hill in 1856. The careful application of the wallpaper under elements of the west entrance architrave also is more consistent with restoration than general redecoration.

The green flocked wallpaper is likely of French manufacture based on its 18-inch width. Catherine Lynn notes that English wallpaper of the mid-19\textsuperscript{th} century was sold in rolls 12 yards long by 21 inches wide, whereas French wallpaper rolls were nine yards

\textsuperscript{174} Lynn, \textit{Wallpapers in America from the Seventeenth Century to World War I}, 303.
The paper substrate provides some indication of the date of the wallpaper. Because the wallpaper was printed on continuous roll paper, it must date to after the 1820s, when wallpaper manufacturers in France began to use machine-made paper. As the uppermost layer of wallpaper, the green flocked paper must also post-date the floral wallpaper. Stylistic evidence suggested that the paper was from the second half of the 19th century, although elements within the design and the colors used point to a date in the last quarter of the 19th century rather than earlier. Based on this information, the paper was either introduced by Lady Waldegrave as part of a second decorative campaign, or as part of redecoration initiated by the Stern family when they acquired the house in the 1880s. Archival research did not uncover any mention of a second round of decorating undertaken by Lady Waldegrave. Further evidence in favor of an association with the Stern family can be found in the 1883 sale catalog following Lady Waldegrave’s death. The catalog lists a drawing room suite upholstered in crimson and a crimson Brussels carpet. The use of crimson in these furnishings would coordinate better with the multi-color floral paper than the monochromatic green flocked paper. This would suggest that the floral wall paper was still in place at the time of the sale, and that the green paper was introduced after Lady Waldegrave’s death, possibly by the Sterns.

6.2.3 Textiles

The results of the textile analysis suggested that wool was present in the sample of red threads (W.06). The composition of Walpole’s original crimson damask is unknown, but some insight into its composition may be derived from the 1842 catalog. The curtains which were listed in the Great North Bedchamber were described as silk.

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175 Ibid.
176 Ibid., 302.
and worsted damask. It is possible the same material would have been used on the walls, a fashionable scheme of the time. The presence of wool in sample W.06 suggests that these fibers are most likely remnants from the original wall coverings. While silk was not detected in the sample, its presence can not be ruled out, as the small size of the sample limited the number of fibers available for testing. M-FTIR analysis confirmed that the fibers were protein-based. Silk and wool are both representative of this category.

Laboratory analysis confirmed that the red velvet found throughout the glazed closet was cotton velvet.
7.0 Recommendations and Conclusions

7.1 Recommendations

Given the results of research and analysis, it is clear that both Walpole and Lady Waldegrave left a permanent imprint on the Great North Bedchamber—Walpole as creator and Lady Waldegrave as restorer. However the room as it exists today reflects the influences of later owners as well. How to interpret a space that embodies not just one period, but 250 years of change creates an interesting dilemma.

Strawberry Hill derives its initial significance from Walpole, whose alterations and additions made it a key building in the 18th-century Gothic Revival movement. Unlike other rooms in the house that pre-date his residency and which were altered to suit his needs, Walpole specifically designed and constructed the Great North Bedchamber. Given this association, one option for the room would be to return it to its original appearance, or its manifestation of the 1780s based on available documentation, and to restore original circulation patterns. If the room is to reflect only Walpole’s design, required changes to finishes would include replacement of the green flocked paper with red damask. More structural changes would also need to be completed, including removing the east entrance and infilling the opening. The glazed closet door would need to be returned to its original location and configuration with glazed upper lights. The room would also not be complete without the great state bed that clearly dominated the space during Walpole’s residency and other missing elements such as the bust of Francois II and the medallions that were above the doors on the west wall would need to be replaced. While these changes would present the room as Walpole designed it, later accretions that may have significance in their own right would be lost, including the
reconfigured circulation pattern, the current rectangular glazed closet door, and the green flocked paper.

Lady Waldegrave also played an important role in the history of Strawberry Hill, as it was her attention that preserved the house. To restore the Great North Bedchamber to Lady Waldegrave’s period would require fewer changes to finishes in the space and the existing entrances and circulation pattern could be retained. The most significant changes would be the replacement of the green flocked paper with the floral wallpaper and installation of wall-to-wall crimson Brussels carpeting. Interpretation of the room could focus on its role as a stylish drawing room of the mid-19th century, and this former function of the room could be represented by a gilt and crimson drawing room suite and multiple card tables. In order to fully present the room as Lady Waldegrave’s, the complete pattern of the floral wallpaper would need to be ascertained, which may or may not be possible depending on how much of the paper remains behind the existing green flocked paper. This option would also require that the green flocked paper be removed.

While these first two scenarios would represent significant periods in the history of the Great North Bedchamber, the room in its current manifestation reflects a much longer evolution than that represented in these initial 100 years. Therefore, a third option for the room would be to stabilize and retain it as is, and interpret the space as it has evolved since its construction in the mid-18th century. In this option all finishes and features would remain as they currently exist, including circulation patterns and the green flocked paper. Some conservation of wallpaper and other finishes might be necessary for stabilization. The view of an extended history was an important part of Walpole’s original design for the Great North Bedchamber and illustrating the evolution of the room from Walpole’s residency through successive owners is a logical extension
of this theme. The opening in the south wall could be maintained so that the exterior trompe l’oeil window would be available for visitors to view. It is recommended that the opening be hinged to maintain the original appearance of the room and to limit the amount of exposure to light and the environment that the painting receives, especially considering that it appears to have deteriorated fairly rapidly since the wall was opened in the 1980s. Retaining the green flocked paper raises the question of its toxicity. If the paper is not disturbed and dampness is minimized so as to discourage the presence of mold, the paper may pose no threat. However, given that many visitors are likely to be school children, risks should be considered and minimized. This may include retaining the wallpaper while limiting access to the room.

Prior to restoration or interpretation of the room to any of these periods however, there are specific actions that should be undertaken. It is strongly recommended that Lady Waldegrave’s records at the Somerset Archive and Record Service be consulted. Documents contained within these archives may provide more documentation of the room as it was during her residency and may answer the question of ownership of the green flocked paper. Until the provenance of the green flocked wallpaper can be firmly established, it is recommended that the paper be retained in situ so that any information that it may provide will not be lost.

Interpretation of the room should also be coordinated with decisions made for the entire house. Whether the presentation and interpretation of rooms is to be diachronic or synchronic, an interpretation plan for the house should be developed to provide guidelines and parameters for a cohesive approach to the overall presentation.
7.2 Conclusions

The rather minimal amount of documentation on the Great North Bedchamber, especially in comparison to other rooms in the house such as the Library, Long Gallery, or Tribune, may be taken by some to indicate the room was not as significant as other spaces. The room may have been overlooked in earlier reviews of the house because it did not contain the extent of exuberant Gothic features found in other spaces. However, it was not the obvious that was important in this space as Walpole designed it. It was the subtle, but completely artificial, way the room was originally planned to depict a continuum of time that was its most significant feature.

A comparison with the 1784 Carter view and the Great North Bedchamber as it exists today illustrates the dynamic and static character of the room. As demonstrated by archival documentation and laboratory analysis, wall coverings in the room changed in material, color, and design several times as part of distinct decorative schemes. Furnishings within the room were also replaced and updated over time, corresponding to changes in ownership. In contrast, the appearance of painted finishes within the room were altered very little and always featured a bicolor scheme of white and gold. The function of the room as a place for gathering also remained relatively consistent over time. Both modified and unmodified elements, taken as a whole, reveal the evolution of the room over 250 years.

While Walpole’s original depiction of layered history may have been lost in subsequent updates to the room, the Great North Bedchamber as it exists today again reflects multiple pasts. In contrast to Walpole’s purposeful portrayal of an artificial passage of time, the room today presents authentic age, where specific features and changes can be linked to subsequent owners. This evolution and the evolution of
Strawberry Hill in general was something that Walpole fully expected and anticipated for he had witnessed the rise and fall of Houghton Hall and many other grand old houses during his lifetime. In 1772, he wrote of Strawberry Hill, “… in short, this old, old, very old castle … is so near being perfect, that it will certainly be ready by the time I die, to be improved with Indian [Chinese-inspired] paper, or to have the windows cut down to the ground by some traveled lady.”  While he was wrong about the type of wallpaper, it was floral not Chinese, Walpole was again playing with time, only this time predicting the future instead of reviving the past.

Appendix 1: Wall Elevations with Sample Locations
North wall with sample locations
North wall, Detail A
South wall
West wall with sample locations
Appendix 2: Paint Analysis
**Great North Bedchamber, Strawberry Hill**

**Paint Stratigraphy Form**

**Sample Number:** C.01  
**Location:** ceiling pendant  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** 1772

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### Layer description (starting from substrate)

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<thead>
<tr>
<th>Layer Description</th>
<th>Campaign</th>
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<tbody>
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<td>Substrate: Plaster</td>
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<td>1. Pink with bright orange particles</td>
<td>1</td>
</tr>
<tr>
<td>2. White</td>
<td></td>
</tr>
<tr>
<td>3. Cream</td>
<td></td>
</tr>
<tr>
<td>4. Yellow size</td>
<td></td>
</tr>
<tr>
<td>5. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
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<tr>
<td>7.</td>
<td></td>
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<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer + : thick layer - : thin layer

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111
Sample Number: **E.01**  
**Location:** panel above east entrance door  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** c. 1850s

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White with bright orange particles /</td>
<td>2</td>
</tr>
<tr>
<td>2. Creamy white /</td>
<td>3</td>
</tr>
<tr>
<td>3. Cream+ /</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
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<td>6.</td>
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<td>8.</td>
<td></td>
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</tbody>
</table>

/: dirt layer  + : thick layer  - : thin layer
Sample E.01: EDS Analysis

300µm Electron Image 1

Pb Lα1 Ca Kα1

Ba Lα1 S Kα1
Sample Number: E.02
Location: trim on north side of east entrance door
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: --

<table>
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<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
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</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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<td>4.</td>
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<td>7.</td>
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<td></td>
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</tbody>
</table>

/ : dirt layer   + : thick layer   - : thin layer
Sample Number: E.03  
Location: east entrance door panel  
Type of illumination: reflected  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: c. 1850s

<table>
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<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White with orange particles</td>
<td>2</td>
</tr>
<tr>
<td>2. Cream (Only partial layer visible)</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
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<tr>
<td>5.</td>
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<td>6.</td>
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<td>7.</td>
<td></td>
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<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer    + : thick layer    - : thin layer
**Sample Number:**  N.01  
**Location:**  north wall, east of east bay window  
**Type of illumination:**  reflected  
**Magnification:**  100x  
**Analysis completed by:**  C. Lombardo  
**Date:**  February 12, 2006  
**Photomicrograph:**  Taken on Fuji film, 25x magnification  
**Date of element:**  1772

<table>
<thead>
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<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Bright white -</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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<tr>
<td>4.</td>
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<td>8.</td>
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</tr>
</tbody>
</table>

/ : dirt layer       + : thick layer       - : thin layer
Great North Bedchamber, Strawberry Hill

Sample Number: N.02
Location: north wall, west bay window, east return panel
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
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</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White+</td>
<td>1</td>
</tr>
<tr>
<td>2. White</td>
<td></td>
</tr>
<tr>
<td>3. White</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
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<td>5.</td>
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<td>6.</td>
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<td>7.</td>
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<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer       + : thick layer       - : thin layer
Sample Number: **N.04**
Location: north wall, west bay window, outer face of tracery
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate), left</th>
<th>Right</th>
<th>Campaign</th>
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</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td>Wood</td>
<td></td>
</tr>
<tr>
<td>1. White /</td>
<td>White</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. White+ /</td>
<td>White+</td>
<td>2</td>
</tr>
<tr>
<td>4. Light gray /</td>
<td>Light gray</td>
<td>3</td>
</tr>
<tr>
<td>5. Creamy white- /</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Bright white+</td>
<td>Bright white</td>
<td></td>
</tr>
<tr>
<td>7. Creamy white</td>
<td>Creamy white</td>
<td>4</td>
</tr>
<tr>
<td>8. White</td>
<td>Bronze</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer         + : thick layer   - : thin layer
Sample N.04: EDS Analysis
Great North Bedchamber, Strawberry Hill

Paint Stratigraphy Form

Sample Number: N.05
Location: north wall, west bay window, east return, top of tracery
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
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</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
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</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. White /</td>
<td>2</td>
</tr>
<tr>
<td>4. White</td>
<td>3</td>
</tr>
<tr>
<td>5. Creamy white</td>
<td>4</td>
</tr>
<tr>
<td>6. Bronze</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
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<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer       + : thick layer       - : thin layer
Sample Number: N.06  
Location: north wall, west bay window, east return surbase bead  
Type of illumination: reflected  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: 1772

<table>
<thead>
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<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Gessoed wood, wood substrate detached from sample</td>
<td></td>
</tr>
<tr>
<td>1. Creamy white+</td>
<td>1</td>
</tr>
<tr>
<td>2. Bright white /+</td>
<td>4</td>
</tr>
<tr>
<td>3. Creamy white</td>
<td></td>
</tr>
<tr>
<td>4. Creamy white</td>
<td></td>
</tr>
<tr>
<td>5. Bronze</td>
<td></td>
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<td>6.</td>
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<td>7.</td>
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<td>8.</td>
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</tbody>
</table>

/ : dirt layer   + : thick layer   - : thin layer
Great North Bedchamber, Strawberry Hill

Sample Number: N.08
Location: north wall, west bay window, east return surbase quarter round
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
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<th>Layer description (starting from substrate)</th>
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</thead>
<tbody>
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<td>Substrate: Wood, no gesso visible</td>
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</tr>
<tr>
<td>1. Pinkish yellow</td>
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</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. White /</td>
<td>2</td>
</tr>
<tr>
<td>4. Light gray -</td>
<td>3</td>
</tr>
<tr>
<td>5. Bright white /</td>
<td></td>
</tr>
<tr>
<td>6. White</td>
<td>4</td>
</tr>
<tr>
<td>7. Bronze</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer  + : thick layer  - : thin layer
Sample Number: N.10

Location: north wall, west bay window, west operable window, center muntin
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: --

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
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</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Bright white</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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<tr>
<td>4.</td>
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<td>5.</td>
<td></td>
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<td>6.</td>
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<td>7.</td>
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<td>8.</td>
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</tbody>
</table>

/ : dirt layer + : thick layer - : thin layer
## Great North Bedchamber, Strawberry Hill

**Paint Stratigraphy Form**

Sample Number: **N.12**
Location: north wall, east bay window, panel behind tracery rib
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
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<td>5.</td>
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<td>6.</td>
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<td>7.</td>
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<td>8.</td>
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</tr>
</tbody>
</table>

/ : dirt layer          + : thick layer       - : thin layer
Great North Bedchamber, Strawberry Hill  Paint Stratigraphy Form

Sample Number:  N.13  
Location:  north wall, east bay window, west return, panel behind tracery rib  
Type of illumination:  reflected  
Magnification:  100x  
Analysis completed by:  C. Lombardo  
Date:  February 12, 2006  
Photomicrograph:  Taken on Fuji film, 25x magnification  
Date of element:  1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White with some red particles</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/: dirt layer  + : thick layer  - : thin layer
Sample Number: **N.14**
**Location:** north wall, east bay window, east return, tracery cusp
**Type of illumination:** reflected
**Magnification:** 100x
**Analysis completed by:** C. Lombardo
**Date:** February 12, 2006
**Photomicrograph:** Taken on Fuji film, 25x magnification
**Date of element:** 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate), left</th>
<th>Right</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. White /</td>
<td>White</td>
<td>1</td>
</tr>
<tr>
<td>2. White- /</td>
<td>Yellow size (not a continuous layer) /</td>
<td></td>
</tr>
<tr>
<td>3. White- /</td>
<td>White /</td>
<td>2</td>
</tr>
<tr>
<td>4. Creamy white+ /</td>
<td>Creamy white+</td>
<td>3</td>
</tr>
<tr>
<td>5. Bright white</td>
<td>Bright white+</td>
<td></td>
</tr>
<tr>
<td>6. Creamy white</td>
<td>Creamy white</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>Bronze</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer     + : thick layer     - : thin layer

---

Great North Bedchamber, Strawberry Hill

Paint Stratigraphy Form
Sample N.14: EDS Analysis

[Image of EDS analysis showing elements such as C, O, Cl, and Zn]
Great North Bedchamber, Strawberry Hill  

Sample Number: W.08  
Location: west wall, baseboard surbase  
Type of illumination: reflected  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: 1772

<table>
<thead>
<tr>
<th>h</th>
<th>Right</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>White</td>
<td>1</td>
</tr>
<tr>
<td>2. White /</td>
<td>White</td>
<td>2</td>
</tr>
<tr>
<td>3. White /</td>
<td>Creamy white- /</td>
<td>3</td>
</tr>
<tr>
<td>4. White</td>
<td>White</td>
<td>4</td>
</tr>
<tr>
<td>5. Bronze</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer  + : thick layer  - : thin layer
Great North Bedchamber, Strawberry Hill
Paint Stratigraphy Form

Sample Number:  W.10
Location:  west entrance door, rondel dutchman
Type of illumination:  reflected
Magnification:  100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph:  Taken on Fuji film, 25x magnification
Date of element:  c. 1850s

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>2</td>
</tr>
<tr>
<td>2. Creamy white</td>
<td>3</td>
</tr>
<tr>
<td>3. White -</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer      + : thick layer     - : thin layer
Sample Number: W.12
Location: west entrance architrave, column capital
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>1</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer + : thick layer - : thin layer
**Sample Number:** W.13  
**Location:** west entrance architrave, floret  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>1</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer + : thick layer - : thin layer
Great North Bedchamber, Strawberry Hill

Sample Number: W.14
Location: west entrance door, south upper panel floret
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Light pink</td>
<td>1</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4. White</td>
<td>4</td>
</tr>
<tr>
<td>5. Bronze</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer       + : thick layer       - : thin layer
**Great North Bedchamber, Strawberry Hill**

**Paint Stratigraphy Form**

**Sample Number:** W.15  
**Location:** west entrance door, north upper panel floret  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>1</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4. White</td>
<td>4 (in some areas)</td>
</tr>
<tr>
<td>5. Bronze</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer  + : thick layer  - : thin layer
Sample Number: W.16
Location: west entrance door, lower panel tracery rib
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

Layer description (starting from substrate)

<table>
<thead>
<tr>
<th>Layer Description</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>1</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4. White</td>
<td>4</td>
</tr>
<tr>
<td>5. Bronze</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer    + : thick layer    - : thin layer
**Sample Number:** W.17  
**Location:** west entrance door panel  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** 1772

Layer description (starting from substrate) | Campaign  
---|---  
Substrate: Wood  
1. White | 1  
2. White | 2  
3. Cream | 3  
4. White | 4

* / : dirt layer  
+ : thick layer  
- : thin layer
Great North Bedchamber, Strawberry Hill  

Sample Number: W.18  
Location: glazed closet architrave, column capital  
Type of illumination: reflected  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: c. 1850s

{| Layer description (starting from substrate) | Campaign |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Plaster</td>
<td></td>
</tr>
<tr>
<td>1. White</td>
<td>2</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer           + : thick layer           - : thin layer
**Great North Bedchamber, Strawberry Hill**  

**Paint Stratigraphy Form**

**Sample Number:** W.19  
**Location:** glazed closet door cornice  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** c. 1850s

---

**Layer description (starting from substrate), leaf detail**

<table>
<thead>
<tr>
<th>Substrate: plaster</th>
<th>Side (shown in photomicrograph)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. White /</td>
<td>White /</td>
<td>2</td>
</tr>
<tr>
<td>2. Yellow size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gold leaf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>White /</td>
<td>3</td>
</tr>
<tr>
<td>5. Bronze</td>
<td>Creamy white</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>Bronze (overpaint)</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer    + : thick layer    - : thin layer
Great North Bedchamber, Strawberry Hill  

Paint Stratigraphy Form

Sample Number: W.20  
Sample Number: W.20  
Location: glazed closet architrave, plinth cap  
Location: glazed closet architrave, plinth cap  
Type of illumination: reflected  
Type of illumination: reflected  
Magnification: 100x  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: c. 1850s

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. White+</td>
<td>2</td>
</tr>
<tr>
<td>2. White</td>
<td></td>
</tr>
<tr>
<td>3. Yellow size</td>
<td></td>
</tr>
<tr>
<td>4. Gold leaf</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/: dirt layer   +: thick layer   -: thin layer
Great North Bedchamber, Strawberry Hill  

**Paint Stratigraphy Form**

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Creamy white</td>
<td>2</td>
</tr>
<tr>
<td>2. White</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer  + : thick layer  - : thin layer

**Sample Number:** W.22  
**Location:** glazed closet, door jamb dutchman  
**Type of illumination:** reflected  
**Magnification:** 100x  
**Analysis completed by:** C. Lombardo  
**Date:** February 12, 2006  
**Photomicrograph:** Taken on Fuji film, 25x magnification  
**Date of element:** c. 1850s
Great North Bedchamber, Strawberry Hill

Paint Stratigraphy Form

Sample Number: W.28
Location: glazed closet door, lower panel floret
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: c. 1850s

Sample Number: W.28
Location: glazed closet door, lower panel floret
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: c. 1850s

Layer description (starting from substrate) | Campaign
--- | ---
Substrate: Composition | 
1. White | 2
2. Yellow size | 
3. Gold leaf | 
4. White | 4
5. Bronze | 
6. | 
7. | 
8. | 

/ : dirt layer + : thick layer - : thin layer
Great North Bedchamber, Strawberry Hill

Paint Stratigraphy Form

Sample Number: **W.30**
Location: glazed closet shelf edge
Type of illumination: reflected
Magnification: 100x
Analysis completed by: C. Lombardo
Date: February 12, 2006
Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Yellow tan</td>
<td>A</td>
</tr>
<tr>
<td>2. White</td>
<td>D</td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/: dirt layer +: thick layer -: thin layer
Sample W.30 - Elements: C, O, Ca, Fe, Cu, Au, Ag, Al, Si, Pb, Fe
Sample Number: W.31  
Location: glazed closet stucco wall  
Type of illumination: reflected  
Magnification: 100x  
Analysis completed by: C. Lombardo  
Date: February 12, 2006  
Photomicrograph: Taken on Fuji film, 25x magnification  
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Stucco</td>
<td></td>
</tr>
<tr>
<td>1. Yellow tan</td>
<td>A</td>
</tr>
<tr>
<td>2. Tan</td>
<td></td>
</tr>
<tr>
<td>3. Light Green</td>
<td>B</td>
</tr>
<tr>
<td>4. Gray</td>
<td>C</td>
</tr>
<tr>
<td>5. White+</td>
<td>D</td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/ : dirt layer   + : thick layer   - : thin layer
Sample W.31: EDS Analysis
Great North Bedchamber, Strawberry Hill

Paint Stratigraphy Form

Sample Number: W.32
Location: glazed closet wall board
Type of illumination: reflected
Magnification: 100x

Analysis completed by: C. Lombardo
Date: February 12, 2006

Photomicrograph: Taken on Fuji film, 25x magnification
Date of element: 1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate: Wood</td>
<td></td>
</tr>
<tr>
<td>1. Yellow tan</td>
<td>A</td>
</tr>
<tr>
<td>2. Tan</td>
<td></td>
</tr>
<tr>
<td>3. Light Green</td>
<td>B</td>
</tr>
<tr>
<td>4. Gray</td>
<td>C</td>
</tr>
<tr>
<td>5. White+</td>
<td>D</td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/: dirt layer  + : thick layer  - : thin layer
Sample Number:  W.33  
Location:  glazed closet shelf cleat  
Type of illumination:  reflected  
Magnification:  100x  
Analysis completed by:  C. Lombardo  
Date:  February 12, 2006  
Photomicrograph:  Taken on Fuji film, 25x magnification  
Date of element:  1772

<table>
<thead>
<tr>
<th>Layer description (starting from substrate)</th>
<th>Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate:  Wood</td>
<td></td>
</tr>
<tr>
<td>1.  Yellow tan</td>
<td>A</td>
</tr>
<tr>
<td>2.  Tan</td>
<td></td>
</tr>
<tr>
<td>3.  Light Green</td>
<td>B</td>
</tr>
<tr>
<td>4.  Gray</td>
<td>C</td>
</tr>
<tr>
<td>5.  White+</td>
<td>D</td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
</tbody>
</table>

/: dirt layer   +: thick layer   -: thin layer
Appendix 3: Wallpaper Analysis
Sample Number: W.01

Sample location: Sample was removed from the lower north side of the glazed closet door

Sample description: Sample is approximately 2” x 5”. Only a portion of the Gothic pattern is visible.

Analysis completed by: C. Lombardo
Date: March 2006

IN SITU EXAMINATION

<table>
<thead>
<tr>
<th>Wallpaper description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portion of walls covered:</td>
</tr>
<tr>
<td>Style:</td>
</tr>
<tr>
<td>Principal colors:</td>
</tr>
<tr>
<td>Texture of paper:</td>
</tr>
<tr>
<td>Flexibility:</td>
</tr>
<tr>
<td>Hand or machine made:</td>
</tr>
<tr>
<td>Technique for producing design:</td>
</tr>
<tr>
<td>Evidence of surface coating:</td>
</tr>
</tbody>
</table>
Wallpaper support

<table>
<thead>
<tr>
<th>Wall surface:</th>
<th>Wood rail and panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition of wall surface:</td>
<td>Good</td>
</tr>
<tr>
<td>Secondary support:</td>
<td>Paper lining and hessian backing</td>
</tr>
<tr>
<td>Quality of adhesion:</td>
<td>Paper not attached directly to wall, pasted to burlap</td>
</tr>
</tbody>
</table>

Environment of wallpaper

| Climate control: | Heat registers, no air conditioning |

LABORATORY ANALYSIS

Composition of paper

<table>
<thead>
<tr>
<th>Fiber content:</th>
<th>Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical characteristics of fibers:</td>
<td>Cotton- long, narrow and twisted</td>
</tr>
</tbody>
</table>

Composition of paints used

<table>
<thead>
<tr>
<th>Media:</th>
<th>Animal glue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigments- ground &amp; principal colors:</td>
<td>Ground- Emerald green, Principal color- gold, Flocking-</td>
</tr>
</tbody>
</table>
Sample W.01: FTIR analysis of green particles
Sample W.01: FTIR analysis of blue particle in green paint

Sample W.01, metallic pigment: C, O, S, Ca, Mg, Cu, Zn, Pb
Sample Number: W.02

Sample location: Sample was removed from the lower north side of the glazed closet door

Sample description: Sample includes three separate pieces, ranging in size from 1”x2” to 1”x 3”. Only a very small portion of the complete design is visible, including some flowers and white ground with gray stripes. Eleven individual colors were identified. Complete design features more colors.

Analysis completed by: C. Lombardo
Date: March 2006
### IN SITU EXAMINATION

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portion of walls covered:</strong></td>
<td>Wallpaper is underneath another layer of wallpaper. Extent remaining is undetermined.</td>
</tr>
<tr>
<td><strong>Style:</strong></td>
<td>Mid-19th c. floral</td>
</tr>
<tr>
<td><strong>Principal colors:</strong></td>
<td>Ground- white with light gray stripes Design- pink, dark pink, light green, dark green, violet, purple, yellow, tan, blue</td>
</tr>
<tr>
<td><strong>Texture of paper:</strong></td>
<td>Smooth</td>
</tr>
<tr>
<td><strong>Flexibility:</strong></td>
<td>Flexible, bends without breaking</td>
</tr>
<tr>
<td><strong>Hand or machine made:</strong></td>
<td>Possibly machine made</td>
</tr>
<tr>
<td><strong>Technique for producing design:</strong></td>
<td>Ground- machine Design- block printed</td>
</tr>
<tr>
<td><strong>Evidence of surface coating:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

### Wallpaper support

| Wall surface:                                     | Wood rail and panel                                                                     |
| Condition of wall surface:                       | Good                                                                                    |
| Secondary support:                               | Paper lining                                                                           |
| Quality of adhesion:                             | Paper not attached directly to wall, pasted to burlap                                    |

### Environment of wallpaper

| Climate control:                                  | Heat registers, no air conditioning                                                     |

### LABORATORY ANALYSIS

#### Paper

| Fiber content:                                    | Cotton                                                                                  |
| Physical characteristics of fibers:              | Cotton- long, narrow and twisted                                                       |

#### Paint

| Media:                                           | Animal glue                                                                             |
| Pigments- ground & principal colors:             | Ground- White and light gray include calcite and gypsum, aluminum silicates and barium silicates. Design- Analysis of pink and dark pink colors suggest that red lead might have been used. Light green is emerald green. Dark green composed of Prussian blue and chrome green. Violet and purple contain ultramarine blue. FTIR suggested yellow contained some chrome yellow, this was not confirmed by SEM-EDS. Tan contains some kaolinite. Blue was not available for analysis. |
Sample W.02: FTIR analysis of gray paint

Sample W.02: EDS analysis of gray paint
Sample W.02: FTIR analysis of green paint
Sample W.02: FTIR analysis of dark green paint

Sample W.02: EDS analysis of dark green paint
Sample W.02: FTIR analysis of pink paint
Sample W.02: EDS analysis of pink paint
Sample W.02: FTIR analysis of dark pink paint

Sample W.02: EDS analysis of dark pink paint
Sample W.02: FTIR analysis of purple paint
Sample W.02: FTIR analysis of violet paint
Sample W.02: EDS analysis of violet paint
Sample W.02: FTIR analysis of tan paint
Sample W.02: FTIR analysis of yellow paint
Appendix 4: Textile Analysis
Great North Bedchamber, Strawberry Hill

**Textile Examination Form**

**Sample Number:** W.06

**Sample location:** Sample extracted from northwest corner of room

**Sample description:** Sample includes a few red threads which are glued together

**Analysis completed by:** C. Lombardo

**Date:** March 2006

---

**Sample W.02**

### IN SITU EXAMINATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portion of walls or surface covered:</strong></td>
<td>A few threads were found in the northwest corner of the room. While other remnants may be located, the majority of the textile is no longer extant</td>
</tr>
<tr>
<td><strong>Principal colors:</strong></td>
<td>Red</td>
</tr>
</tbody>
</table>

**Textile support**

<table>
<thead>
<tr>
<th>Surface</th>
<th>Wood rail and panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition of wall surface:</strong></td>
<td>Good</td>
</tr>
<tr>
<td><strong>Method of adhesion:</strong></td>
<td>Textile is tacked to wall. A few tacks remain in situ</td>
</tr>
</tbody>
</table>

**Environment of textile**

| **Climate control:**       | Heat registers, no air conditioning                                     |

### LABORATORY ANALYSIS

**Fiber**

| **Fiber content:** | Wool |

| **Physical characteristics of fibers:** | Wool- long, narrow with scaling |

**Dye**

| **Color:** | Red |

| **Source:** | Undetermined |
Sample W.06: FTIR analysis
Sample Number: W.35

Sample location: Sample extracted from glazed closet

Sample description: Sample includes two pieces approximately 0.5” x 3”

Analysis completed by: C. Lombardo

Date: March 2006

---

Sample W.35

### IN SITU EXAMINATION

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portion of walls or surface covered:</strong></td>
<td>Textile covers inside of jamb and shelves within the glazed closet. Possibly also covered walls of closet</td>
</tr>
<tr>
<td><strong>Principal colors:</strong></td>
<td>Red</td>
</tr>
</tbody>
</table>

#### Textile support

<table>
<thead>
<tr>
<th>Surface:</th>
<th>Wood jamb and shelves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition of wall surface:</td>
<td>Good</td>
</tr>
<tr>
<td>Method of adhesion:</td>
<td>Textile is glued to jamb and shelves</td>
</tr>
</tbody>
</table>

#### Environment of textile

| Climate control:             | Heat registers, no air conditioning                                   |

---

### LABORATORY ANALYSIS

#### Fiber

<table>
<thead>
<tr>
<th>Fiber content:</th>
<th>Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical characteristics of fibers:</strong></td>
<td>Long, narrow and twisted</td>
</tr>
</tbody>
</table>

#### Dye

<table>
<thead>
<tr>
<th>Color:</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source:</td>
<td>Undetermined</td>
</tr>
</tbody>
</table>
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