

## **Canaletto's Colour: The inspiration and implications of changing grounds, pigments and paint application in the artist's English period**

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## **High Art and High Stakes: The 3rd Duke of Dorset's Gamble on Reynolds**

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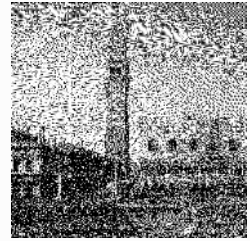
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# Canaletto's Colour: The inspiration and implications of changing grounds, pigments and paint application in the artist's English period

Article by **Roxane Sperber** Article and **Jens Stenger**



## **Abstract**

This article explores the English period of Giovanni Antonio Canal (Canaletto) from a technical perspective. Six paintings by the artist, from the collection of the Yale Center for British Art, compose the focus of the study. Addressing the question of whether Canaletto's English paintings were different or, as has long been held, inferior to his Venetian works, this article details changes to the artist's grounds, painting technique, and palette when working in England.

The arrival of Giovanni Antonio Canal, the “Famous Painter of Views”, in England was ceremoniously recorded in the notebook of the meticulous chronicler of the eighteenth-century London art world, George Vertue.<sup>1</sup> Canaletto came to England from Venice at the end of May 1746 and spent nine years there, with an eight-month trip back to Venice from 1750–51.<sup>2</sup> There is no consensus on exactly what prompted Canaletto to come to England. It is widely believed that the reduction in travel to Venice by his English Grand Tour patron base, due to the outbreak of the War of the Austrian Succession, may have encouraged the artist to relocate.<sup>3</sup>

Vertue’s first mention of Canaletto praises him as “much esteemed” and proclaims that there is “no doubt but what Views and works He doth here [in England], will give the same satisfaction” as his Venetian views.<sup>4</sup> However, by 1749 Vertue’s enthusiasm had waned. “On the whole of him something is obscure or strange. He does not produce works so well done as those of Venice or other parts of Italy, which are in Collections here, and done by him there.”<sup>5</sup>

Suspicion about the artist grew and a rumour circulated that he might be an imposter posing as the great Canaletto or that he had an unknown assistant painting his pictures in Venice.<sup>6</sup> Vertue later corrected the false accusation regarding the Venetian’s identity, explaining that the confusion was owing to Bernardo Bellotto, Canaletto’s nephew and former assistant, using the same name as his uncle.<sup>7</sup>

While it is true that Bellotto was using his uncle’s name, the motivation for the rumour may have been rather more sinister.<sup>8</sup> The perception among English artists like William Hogarth, that foreign talent threatened their livelihoods, led to a patriotic movement that in turn fuelled xenophobic attitudes. Such xenophobia encouraged hostility towards foreign artists like Canaletto.<sup>9</sup>

Furthermore, by the time Canaletto arrived in England many of his Venetian paintings were already in the hands of English patrons who had purchased the works on the Grand Tour.<sup>10</sup> There were also numerous Canaletto imitators who would have had personal reasons for wanting to damage the reputation of the Venetian master.<sup>11</sup>

Watercolourist Edward Dayes, writing at the turn of the nineteenth century, described the fervent attempts to discredit Canaletto:

*the picture dealing tribe carried their assurance so far, as to deny that Canaletti was the person who painted his pictures at Venice, that is, on his arrival in London; and when, by provocation, he was tempted to sit down, and produce some, to convince the public, they still persisted that the pieces now produced were not in the same style; an assertion which materially injured him for a time, and made him almost frantic. By this scheme they hoped to drive him from the country, and thereby prevent him from detecting the copies they had made from his works, which were in great repute.*<sup>12</sup>

Whatever the impetus for such rumours, the perception that Canaletto’s painting declined from the time he left Venice has persisted in the art-historical cannon. In an essay from 1929, Giuseppe Fiocco wrote disparagingly that the artist’s painting “became more china-like and his figures lost their living quality and came to be the merest signs, like bundles of coloured wool. . . . How and when can this change have come about? A change that is even to our impartial eyes an obvious and lamentable retrogression.”<sup>13</sup> Even W. G. Constable, who compiled Canaletto’s catalogue raisonné, expressed his disillusion with the artist’s English works, stating that “the imaginative element that inspired his better work was almost consistently absent.”<sup>14</sup>

Despite the long-standing perception that Canaletto's English paintings are of lesser quality than his Venetian views, the artist's technique was not in decline from the time he left Venice but continually changing throughout his career. Not only did he evolve and experiment, but he often returned to technical approaches used decades before. As such, it can be difficult to date his works based on style or to isolate the motivation for changes to his technique.<sup>15</sup> Yet, it is undeniable that there is a certain quality to Canaletto's English painting that does not exist in his work before or after this period.

This article will investigate Canaletto's English paintings from a technical point of view, with the aim of assessing the long-held belief that they are inferior in quality.<sup>16</sup> Concrete technical changes that occur during his English period will be identified and the inspiration and implication of these changes explored. Changes to the ground structure, paint application, and palette will be discussed using six paintings from the Yale Center for British Art (YCBA) collection (Figs. 1, 2, 3, 4, 5, 6).<sup>17</sup> These works span the artist's period in England from 1746 to 1755.



Figure 1

Giovanni Antonio Canal (Canaletto), *Westminster Bridge, with the Lord Mayor's Procession on the Thames*, 1747, oil on canvas, 95.9 x 127.6 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.94).



Figure 2

Giovanni Antonio Canal (Canaletto), *Old Walton Bridge*, 1755, oil on canvas, 46 x 122.2 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1981.25.86).



Figure 3

Giovanni Antonio Canal (Canaletto), *St Paul's Cathedral*, circa 1754, oil on canvas, 52.1 x 61.6 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.95).



Figure 4

Giovanni Antonio Canal (Canaletto), *Warwick Castle*, 1748-49, oil on canvas, 72.4 x 119.9 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1994.18.2).



Figure 5

Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward St Paul's*, circa 1750, oil on canvas, 38.6 x 72.9 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.96).



Figure 6

Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward Westminster*, circa 1750, oil on canvas, 38.7 x 71.8 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.97).

## Changing grounds

The most consistent change to Canaletto's technique while working in England was his choice of ground. The artist switched from a traditional Venetian ground, which was warm red or orange in colour (fig. 7), to a traditional English ground that was cool grey in colour (fig. 8).<sup>18</sup> The impetus for this change was the result of several factors, perhaps the most obvious being that light-coloured grounds were commercially available in England.

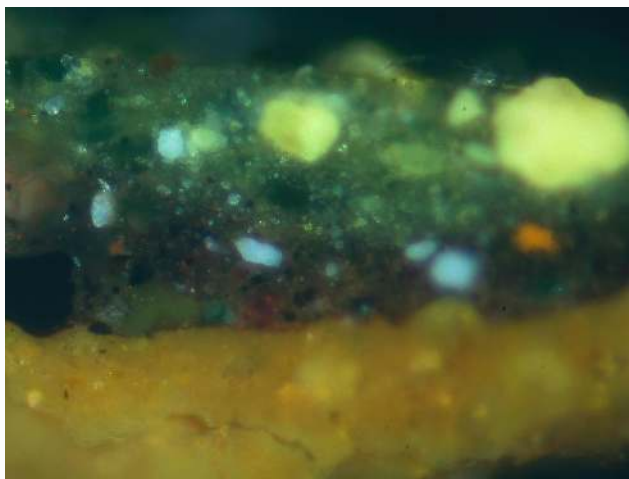


Figure 7

Cross-section from an area of green trees on the horizon, Giovanni Antonio Canal (Canaletto), *Venice: the Piazzetta towards S. Giorgio Maggiore* (fig. 20), circa 1724, oil on canvas, 173.0 × 134.3 cm. Digital image courtesy of Roxane Sperber.

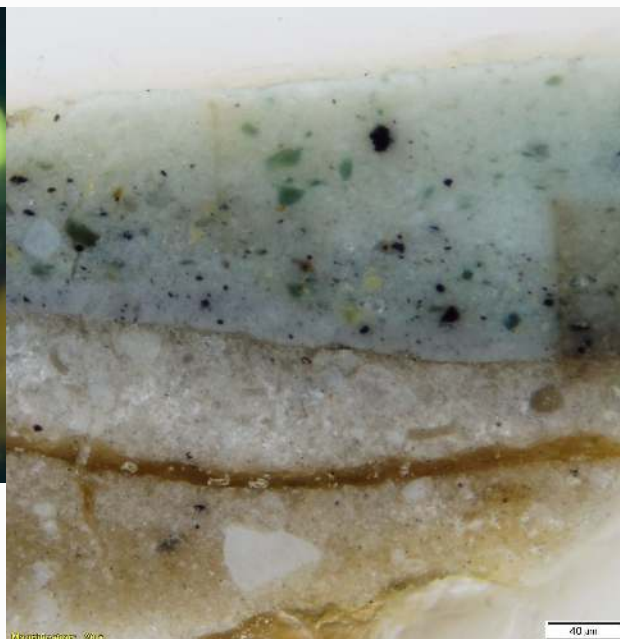


Figure 8

Cross-section from area of water with wave, Giovanni Antonio Canal (Canaletto), *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (fig. 1), 1747, oil on canvas, 95.9 × 127.6 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.94). Digital image courtesy of Roxane Sperber.

## Commercially prepared canvas

A survey of eighteenth-century English paintings at Tate found that painters used remarkably standard oil grounds composed of lead white, chalk, and varying amounts of black and earth pigments. Grounds were usually applied in two or more layers with a layer of glue size sometimes separating the grounds.<sup>19</sup> In *The Practice of Painting and Perspective Made Easy*, a treatise from 1756, Thomas Bardwell credits Godfrey Kneller with the invention of “cool grey-coloured Cloths” after breaking with the methods of Peter Lely.<sup>20</sup> By the 1730s through the mid-1750s most British painters were using grey grounds.<sup>21</sup>

It is likely this consistency in ground structure is a result of eighteenth-century English artists purchasing commercially prepared canvases from colourmen.<sup>22</sup> Mention of commercially prepared grounds is found in late seventeenth and eighteenth-century sources. *The Excellency of the pen and pencil*, a treatise by an anonymous English author from 1668, advises readers to purchase “Cloth primed”, stating “I could teach you how to prime it, but it is moiling work, and

besides, it may be bought ready primed cheaper and better than you can do your self. Few Painters (though all can do it) prime it themselves, but buy it ready done.”<sup>23</sup> Robert Dossie’s *Handmaid to the Arts* also describes “the pieces of canvas, prepared by proper primings” as “the most common grounds for oil painting”.<sup>24</sup>

The Canaletto paintings studied at the YCBA have grounds consistent with commercially prepared English grounds of the period.<sup>25</sup> All have a double-ground layer structure separated by a layer of glue size (figs. 9, 10, 11, 12, 13). The grounds vary slightly in tone and pigment composition, but are always light in colour.<sup>26</sup>

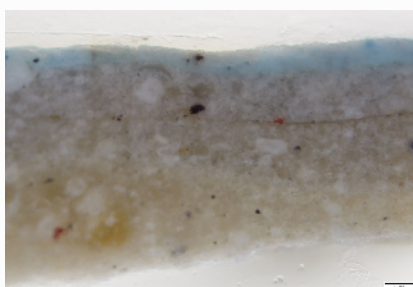


Figure 9

Cross-section from the sky, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward Westminster* (fig. 6), circa 1750, oil on canvas, 38.7 × 71.8 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.97). Digital image courtesy of Roxane Sperber.

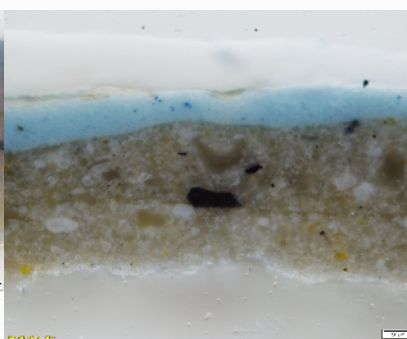


Figure 10

Cross-section from the sky, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward St Paul's* (fig. 5), circa 1750, oil on canvas, 38.6 × 72.9 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.96). Digital image courtesy of Roxane Sperber.

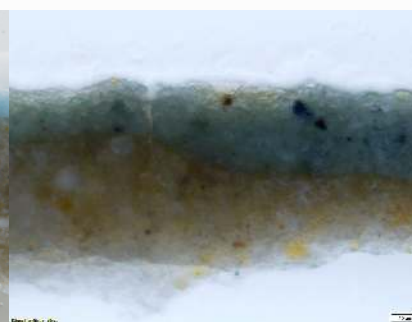


Figure 11

Cross-section from area of water, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Yale Center for British Art, New Haven, Connecticut (B1981.25.86). Digital image courtesy of Roxane Sperber.

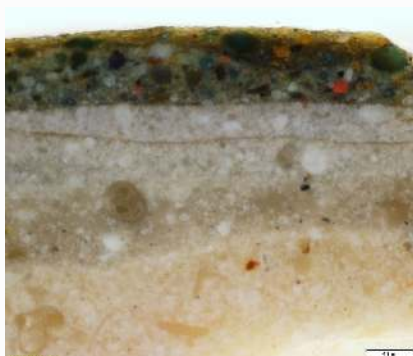


Figure 12

Cross-section from an area of grass, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Yale Center for British Art, New Haven, Connecticut (B1994.18.2). Digital image courtesy of Roxane Sperber.



Figure 13

Cross-section from an area of grass, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Yale Center for British Art, New Haven, Connecticut (B1981.25.86). Digital image courtesy of Roxane Sperber.

Additionally, elemental analysis of the black pigments in the ground and paint layer supports the suggestion that Canaletto was buying commercially prepared canvases. Black pigments found in the paint layer were found to consistently contain phosphorous while those in the grounds did not. This suggests that the black in Canaletto's palette was bone black, a different pigment than the carbon black identified in the ground (figs. 14, 15).

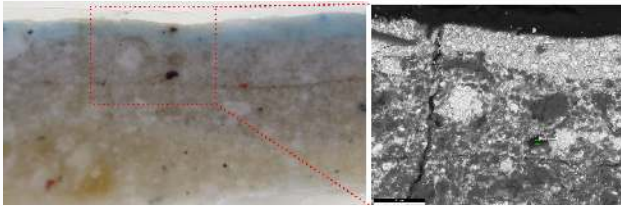


Figure 14

Cross-section detail of ground detail structure, visible light (left), detail of ground structure, S, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward Westminster* (fig. 6), circa 1750, oil on canvas, 38.7 × 71.8 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.97). Digital image courtesy of Roxane Sperber.

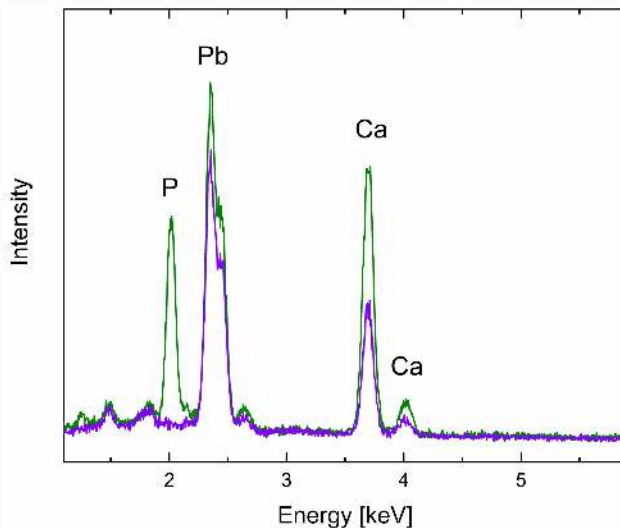


Figure 15

EDX spectra comparison of black particle in ground showing no peak for phosphorous (P) (purple line), Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward Westminster* (fig. 6), circa 1750, oil on canvas, 38.7 × 71.8 cm. Digital image courtesy of the Institute for the Preservation of Cultural Heritage (IPCH).

The identification of commercially prepared grounds in Canaletto's English paintings is not surprising given that he appears to have purchased commercially primed canvas in Venice.<sup>27</sup> Technical studies have found that when working in Venice Canaletto used exclusively warm red and orange grounds, even when painting English subjects. A comparison between two versions of the same pendant pair composition, a scene of the River Thames looking east and west from the Somerset House terrace, exemplifies the artist's use of

different commercially prepared grounds when painting the same composition in England and Venice. The YCBA versions, *The Thames from the Terrace of Somerset House, Looking toward St Paul's* (fig. 5), and *The Thames from the Terrace of Somerset House, Looking toward Westminster* (fig. 6) were painted in London before 1750 and have typical eighteenth-century English grounds (figs. 9, 10).<sup>28</sup>

The Royal Collection pair, *London: The Thames from Somerset House Terrace towards the City* (fig. 16) and *London: The Thames from Somerset House Terrace towards Westminster* (fig. 17), were painted during the artist's eight-month return to Venice in 1750–51 and have rough grounds of red earth pigments (untested) followed by a light layer of artist-applied *imprimatura* (figs. 18, 19).<sup>29</sup> This comparison suggests that Canaletto acquired commercially primed canvases in both countries and adjusted his Venetian canvas with a substantial layer of cool *imprimatura* to obtain a lighter surface that more closely matched the English canvas.<sup>30</sup>



Figure 16

Giovanni Antonio Canal (Canaletto), *London: The Thames from Somerset House Terrace towards the City*, 1750–51, oil on canvas, 107.9 × 188 cm. Digital image courtesy of Royal Collection, London, UK (RCIN 400504).



Figure 17

Giovanni Antonio Canal (Canaletto), *London: The Thames from Somerset House Terrace towards Westminster*, 1750–51, oil on canvas, 107.6 × 187.9 cm. Digital image courtesy of Royal Collection, London, UK (RCIN 400506).

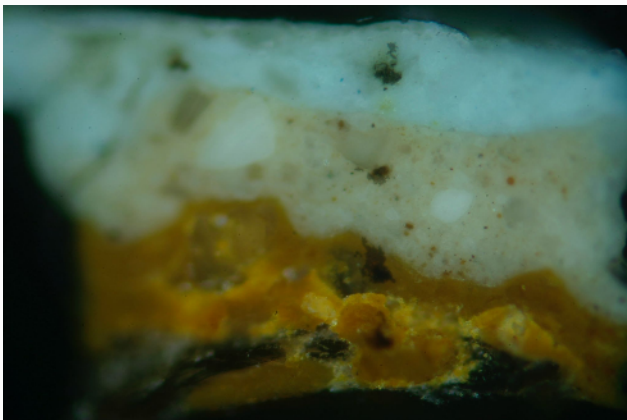


Figure 18

Cross-section from the sky, Giovanni Antonio Canal (Canaletto), *London: The Thames from Somerset House Terrace towards the City* (fig. 16), 1750–51, oil on canvas, 107.9 × 188 cm. Digital image courtesy of Royal Collection, London, UK (RCIN 400504).



Figure 19

Cross-section from the sky, Giovanni Antonio Canal (Canaletto), *London: The Thames from Somerset House Terrace towards Westminster* (fig. 17), 1750–51, oil on canvas, 107.6 × 187.9 cm. Digital image courtesy of Royal Collection, London, UK (RCIN 400506).

Documentary sources support the physical evidence that Canaletto worked on commercially primed canvases in Venice. In a letter from Venetian engraver and art dealer Anton Maria Zanetti the elder to Arthur Pond, dated 5 March 1729, Zanetti outlines the costs shouldered by him for the supply of “tella, imprimatura” to Canaletto.<sup>31</sup> In light of this, it is unsurprising that the artist continued purchasing commercially prepared canvases upon arrival in England.

Of the English views at the YCBA, *The Thames . . . Looking toward St Paul’s*, *The Thames . . . Looking toward Westminster*, and *Warwick Castle* have areas of unpainted ground that extend onto original tacking margins.<sup>32</sup> This indicates that the canvas was primed before it was stretched. A source from 1808 lists pre-stretched canvases available to artists in standard sizes: Kit-cat (3 ft x 2 ft 4 in./ 91.5 x 71.1 cm), three-quarters (2 ft 6 in. x 2 ft 1 in./ 76.2 x 33 cm), half-length (4 ft 2 in. x 3 ft 4 in./ 127 x 101.6 cm), Bishops half-lengths (4 ft 8 in. x 3 ft 9 in./ 142.2 x 114.3 cm), and whole-lengths (7 ft 10 in. x 4 ft 10 in./ 238.76 x 147.32 cm).<sup>33</sup> These set canvas sizes were also available in the eighteenth century.<sup>34</sup>

However, none of the dimensions of the YCBA paintings conform to set standards. This suggests that Canaletto was either ordering pre-stretched canvases of a specific size from a colourman or buying the commercially primed canvas and stretching it onto bespoke stretchers.

A list dating from 1763 of colourmen in London records the principal tradesmen who “prepare canvases of all sizes ready stretched on frames, which is quite foreign to the business of the ordinary colour shop”.<sup>35</sup> Laughton Osborne’s compilation of European sources on artists’ painting and materials, from 1845, describes canvas as “kept, ready-primed, in rolls of various width, at the colourmen’s, who need but a few hours’ notice to cut it and distend it on the frames to any proportion that may be desired”.<sup>36</sup> This source is, of course, from a century after that in which Canaletto was painting in England. However, the availability of commercially prepared canvas in eighteenth-century London, and the fact that some colourmen were stretching bespoke canvas by 1763, suggests that Canaletto may have purchased his primed and stretched canvases in much the way Osborne describes.

It would be easy for Canaletto to acquire his pigments, brushes, medium, and painting supports without travelling a great distance. He lived on Silver Street (today Beak Street) near Golden Square in Soho.<sup>37</sup> This location was within walking distance of many colourmen’s shops in and around Covent Garden, the heart of the eighteenth-century art world.<sup>38</sup> There were at least ten colourmen who sold painting supplies within an approximately twenty-minute walk from Canaletto’s studio.<sup>39</sup> This is not to say that proximity would have dictated where an artist as particular as Canaletto purchased his supplies, but it is likely that he developed a working relationship with at least one of the merchants in the locality.

Silver Street was an area intended for tradesmen and people of lower middle-class occupation. It was composed of inexpensively but well-constructed four-storey houses with rooftop garrets.<sup>40</sup> Interestingly, the Venetian painter Jacopo Amigoni also lived on Silver Street during his decade in London, leaving shortly before Canaletto’s arrival. This may suggest that there was a community of Italian artists living in the area.<sup>41</sup>

Eighteenth-century artists sometimes acquired stretchers directly from tradesmen. Arthur Pond bought his stretchers from a carpenter by the name of Mr Weston who also crated finished works.<sup>42</sup> Canaletto lodged with a cabinetmaker called Mr Wiggan.<sup>43</sup> It is tempting to think that he avoided the hassle of transporting large stretchers on foot, or the cost of hiring a porter, chairmen, or coach, by paying Mr Wiggan, or another local tradesman, to build the stretchers, and that he purchased commercially prepared canvas to stretch himself.

### Artistic evolution

In addition to the convenience of painting on a commercially prepared ground, Canaletto's decision to move to a light preparation layer was a natural stylistic progression. He began his career as a scene painter in his father's workshop, but by 1720 he had begun making his own easel paintings.<sup>44</sup> These early works do not demonstrate the even, measured tonality and meticulous detail of his later paintings. Rather, they have "exuberant and highly textured brushwork, dramatic contrasts of deep shadow and radiant sunlight".<sup>45</sup>



Figure 20

Giovanni Antonio Canal (Canaletto), *Venice: the Piazzetta towards S. Giorgio Maggiore*, circa 1724, oil on canvas, 173.0 × 134.3 cm. Digital image courtesy of Royal Collection, Buckingham Palace, London, UK (RCIN 401036).

Canaletto's paintings up to 1727 are marked by the contrasts of light and shadow. Highlights are applied directly to the dark red ground allowing the artist to capture dramatic light and construct architectural form.<sup>46</sup> A set of six views of the Piazza San Marco in Venice exemplifies this technique.<sup>47</sup> These paintings may have been Canaletto's earliest commission from his enthusiastic patron and art dealer Joseph Smith.<sup>48</sup> Cross-section samples from *Venice: the Piazzetta towards S. Giorgio Maggiore* (fig. 20), taken at the Hamilton Kerr Institute (HKI), illustrate the application of paint directly over the ground (fig. 7).<sup>49</sup>

This aspect of the artist's early technique was phased out by 1730 when Canaletto began applying a cool grey or beige *imprimatura* over the commercially prepared Venetian ground (see figs. 18, 19).<sup>50</sup> David Bomford and Gabriele Finaldi attribute the introduction of this unified underlayer to the "dramatic change between the hot, dark tones of the early paintings and the blond, cool light in the paintings that followed".<sup>51</sup> They rightly suggest that this

change accounts for the move from a "fitful, glittering sun" to the "steady silver light" that was desired by the Grand Tourists.<sup>52</sup>



Figure 21

Detail of applied shadow over midtone imprimatura, Giovanni Antonio Canal (Canaletto), *Venice: The Grand Canal from the Carità towards the Bacino*, circa 1727–28, oil on canvas, 48.0 × 80.0 cm. Digital image courtesy of Royal Collection, Hampton Court Palace, East Molesey, Surrey, UK (RCIN 400523).

Canaletto's application of a light *imprimatura* reflects his preference for painting applied shadows. Rather than leaving the dark red ground exposed or glazing over it to create shadows, the artist preferred to mix the colour of shadows and apply them in distinct shapes (fig. 21).<sup>53</sup> The light *imprimatura* over the warm red Venetian ground created a midtone surface that allowed Canaletto to paint in this way.

By his arrival in England in 1746, Canaletto's preference for painting on a lighter preparation layer was well established. He would have found it advantageous that he could purchase canvases with commercially prepared light grounds from London colourmen. This allowed him to avoid the step of modifying the dark grounds with a light *imprimatura*, as he was accustomed to doing in Venice. If this were not the case, he could have easily applied a warm, red *imprimatura* to the commercially available English canvases; but in no example that has been observed during this study or other published studies did he do this.

#### Capturing diffuse glow

A light ground was appropriate for the effect Canaletto wished to achieve in his English paintings. Following the inclination to create "steady silver light", Canaletto's English paintings have a diffuse light that surpasses that of his Venetian works. This distinct tonality is created by the light ground in his English paintings.<sup>54</sup> In contrast to the bright, southern sun of Venice, the artist captures the even, dappled light of England.

Waldemar Januszczak observed the impossible sunlight that bathes Canaletto's English scenes and notes that "while it's fair to doubt he really encountered all that good weather while he was over here, it's also true that he captures perfectly the feel of an English summer's day as it exists in most of our imaginations."<sup>55</sup> Indeed, Canaletto's English works in many ways mirror his capriccios, where he painted an imagined scene. The use of a light ground allowed the artist to move always from the dusty, sharp shadows of Venice to the even sun of the most glorious English summer's day.

## Changing application of paint

One of the greatest misconceptions about Canaletto's technique is that he was a fastidious, rigid painter. His early works are painted with energetic, painterly brushstrokes and his post-England views have confident, calligraphic paint handling. At the height of his production of Venetian views, from the 1730s through the early 1740s, the artist developed a style that was highly refined and meticulous to the point of looking somewhat mechanical.<sup>56</sup> But in England, his application of paint became abbreviated and painterly once again. Nevertheless, his English views maintain the illusion of realism that gained him fame in Venice.

The question of underdrawing

How the artist transferred his compositions to canvas remains unanswered. Despite the fact that Canaletto was a prolific draftsman, infrared reflectography has not identified any carbon-containing underdrawing in media such as graphite, ink, or black chalk.<sup>57</sup> It is of course possible that the artist used a non-carbon-containing media like red chalk or iron gall ink to transfer his compositions, but microscopy has also been unsuccessful in identifying areas of underdrawing seen through the paint layers.<sup>58</sup>

A study by Elise Effmann of the *View of the Molo* (1725), found that the artist constructed architectural forms directly over the preparation layer “with broad brushstrokes of thick paint, quickly establishing the basic planes of the composition”.<sup>59</sup> Only after the architecture was in place did he paint the sky and water.<sup>60</sup> This suggests that from the early part of his career Canaletto was accustomed to sketching his compositions in paint.

Similarly, in the English paintings examined for this study, Canaletto’s blocking-in layer appears to be the first step in his painting process. The artist was clean and deliberate in his application of paint and would likely have avoided smears of messy underdrawing in chalk or charcoal by opting to block in his forms in paint.<sup>61</sup> Rather, he may have used highly finished drawings, of which many exist, as a guide when painting his compositions.<sup>62</sup>

Order of painting

Canaletto established a sequence for his application of paint by the beginning of his mature period in 1730.<sup>63</sup> Broadly speaking, the artist worked from loose areas of blocked-in colour to a refined, detailed surface. After applying the layer of light *imprimatura*, in the case of his Venetian paintings, the artist blocked in the sky, leaving a rough reserve for the prominent forms in the foreground. The artist then established the compositional forms in the middle ground and finally the foreground.

The forms of the buildings were established during the blocking-out stage through the application of shadows in one colour and highlights in another. Architectural details often extend over the paint onto the sky to create crisp edges to the buildings (fig. 22). Over the blocking-out layer a second layer of paint in thick brush strokes was applied to create surface texture on the buildings and pavement as well as the brushy clouds in the sky (fig. 23).



Figure 22

Detail of arch of building extending over sky and outlining on receding buildings, Giovanni Antonio Canal (Canaletto), *The Molo from the Bacino di San Marco on Ascension Day, with the Bucintoro* (fig. 24), circa 1745, oil on canvas, 114.9 x 162.6 cm. Digital image courtesy of Philadelphia Museum of Art, Philadelphia, Pennsylvania (E1924-3-48).



Figure 23

Detail of surface texture and incision lines, Giovanni Antonio Canal (Canaletto), *The Molo from the Bacino di San Marco on Ascension Day, with the Bucintoro* (fig. 24), circa 1745, oil on canvas, 114.9 x 162.6 cm. Digital image courtesy of Philadelphia Museum of Art, Philadelphia, Pennsylvania (E1924-3-48).

The refining process of incising and outlining transformed the rough blocks of colour into elaborately designed architectural spaces. Edges of forms and details of the architecture were established using incision lines that were scratched into the blocking-in layer while the paint was still wet (fig. 23). Outlining in black paint, often following a straight edge, was applied to emphasize architectural details. Incision lines provided a guide for the outlining of circles and arches, and decorative details were even scratched freehand into the paint. Sometimes, a softer grey paint was used in the distance to articulate receding space (fig. 22). The contrasting use of black and grey outlining can be seen in a detail from *The Molo from the Bacino di San Marco on Ascension Day, with the Bucintoro* (fig. 24), now in the collection of the Philadelphia Museum of Art.



Figure 24

Giovanni Antonio Canal (Canaletto), *The Molo from the Bacino di San Marco on Ascension Day, with the Bucintoro*, circa 1745, oil on canvas, 114.9 × 162.6 cm. Digital image courtesy of Philadelphia Museum of Art, Philadelphia, Pennsylvania (E1924-3-48).

Boats and figures were painted in last over a completed backdrop. This addition of “characters” at a late stage in the process may relate to the artist’s early experience with scene-painting.<sup>64</sup>

#### Simplification of paint application

Upon arrival in England, Canaletto maintained the same general sequence of building up his paintings but made the process more immediate. This is especially clear in the refining stages of the painting. Except for using a compass to incise the shapes for arches and domes (Figs. 25, 26, 27), the artist abandoned the use of incision lines to guide the outlining, articulate perspective, and create three-dimensionality in buildings.



Figure 25

Detail showing compass incision lines on arch of Westminster Bridge, Giovanni Antonio Canal (Canaletto), *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (fig. 1), 1747, oil on canvas, 95.9 × 127.6 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.94). Digital image courtesy of Roxane Sperber.



Figure 26

Detail showing compass incision lines on Westminster Bridge, Giovanni Antonio Canal (Canaletto), *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (fig. 1), 1747, oil on canvas, 95.9 × 127.6 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.94). Digital image courtesy of Roxane Sperber.



Figure 27

Detail showing compass incision lines on dome of St Paul's Cathedral, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward St Paul's* (fig. 5), circa 1750, oil on canvas, 38.6 × 72.9 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.96). Digital image courtesy of Roxane Sperber.

This stylistic change is illustrated by the way buildings along the Thames are painted in the YCBA's *The Thames . . . Looking toward Westminster* (fig. 28) in comparison to the buildings along the canal in *A Regatta on the Grand Canal* (fig. 29) from the National Gallery, London. Despite being a large painting (122.1 x 182.8 cm) that requires the viewer to stand back to view the work, the buildings that recede into the distance in *A Regatta on the Grand Canal* are painted with extraordinary attention to detail. Incision lines establish the perspective of the buildings, marking the top and bottom boundaries of the windows and the slopes of the roofs.



Figure 28

Detail of buildings in the distance along the River Thames, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward Westminster* (fig. 6), circa 1750, oil on canvas, 38.7 x 71.8 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.97).



Figure 29

Detail of buildings in the distance along the canal, Giovanni Antonio Canal (Canaletto), *A Regatta on the Grand Canal*, circa 1740, oil on canvas, 122.1 x 182.8 cm. Digital image courtesy of National Gallery, London, UK (NG4454).

In contrast, the buildings in the distance in *The Thames . . . Looking toward Westminster* are abbreviated despite the small size of the canvas (38.7 x 71.8 cm), which invites the viewer to take an intimate viewing distance. There are no incision lines visible in the paint layer in this area and the outlining in a light grey tone is done with a comparatively large brush for such a small painting.

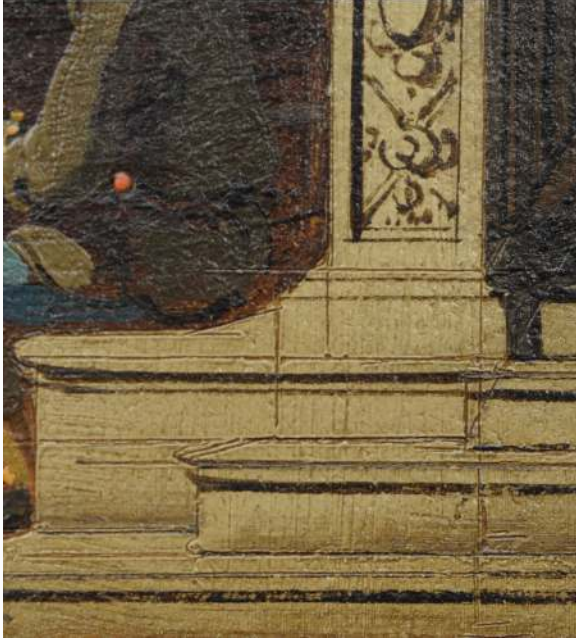


Figure 30

Detail of incision lines on stairs, Giovanni Antonio Canal (Canaletto), *Venice: Caprice View of the Courtyard of the Doges' Palace with the Scala dei Giganti*, circa 1744, oil on canvas, 108.2 × 129.9 cm. Digital image courtesy of Royal Collection, London, UK. (RCIN 406012).

This example illustrates the efficiency of the painting process during Canaletto's English period. He makes what was a two-step process of incising and outlining into a single step. The abrupt abandoning of incision lines in his English works is especially apparent when compared to the paintings from his last commission in Venice, a series of overdoors for Joseph Smith. In the overdoor series the artist used incision lines extensively to establish the forms of everything from stairs to architectural details (fig. 30). In his earliest English paintings, approximately two years later, this practice all but disappeared.

A comparison of two views of Greenwich Hospital provides another example of this change. The first view was painted from an engraving by Jean-Baptiste Rigaud shortly before Canaletto came to England (fig. 31).<sup>65</sup> The second, in the National Maritime Museum, was painted during the artist's stay in England, probably before 1750 (fig. 32).<sup>66</sup> The painting from Venice shows the artist's extensive use of incising into the paint layer to establish the perspective and architectural forms

of the hospital building (fig. 33). The painting from England has no such incising lines and achieves a similar effect by replacing incising and outlining with black outlining alone (fig. 34).



Figure 31

Giovanni Antonio Canal (Canaletto), *A View of Greenwich from the River*, before 1746, oil on canvas, 59.1 × 94.0 cm. Digital image courtesy of Tate, 2016 (L01926).



Figure 32

Giovanni Antonio Canal (Canaletto), *Greenwich Hospital from the North Bank of the Thames*, circa 1750–52, oil on canvas, 68.6 × 106.7 cm. Digital image courtesy of National Maritime Museum, Greenwich, London, UK (BHC1827).

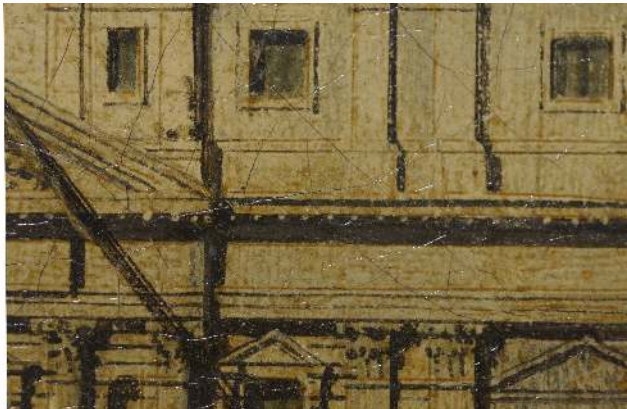


Figure 33

Detail of incision lines on hospital building, Giovanni Antonio Canal (Canaletto), *A View of Greenwich from the River* (fig. 31), before 1746, oil on canvas, 59.1 × 94.0 cm. Digital image courtesy of Tate, 2016 (L01926).

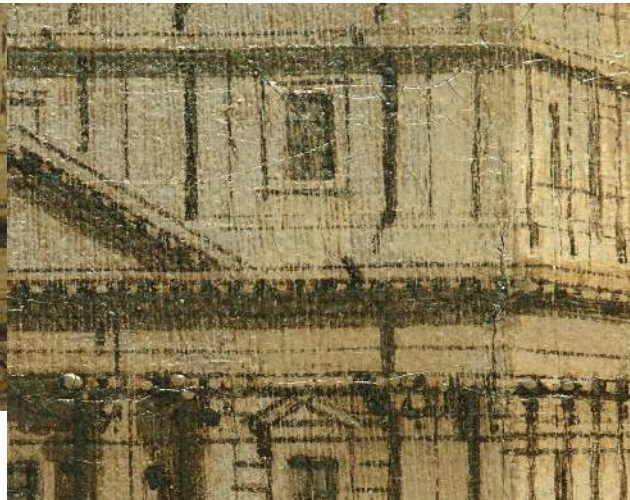


Figure 34

Detail of outlining on hospital building, Giovanni Antonio Canal (Canaletto), *Greenwich Hospital from the North Bank of the Thames* (fig. 32), circa 1750–52, oil on canvas, 68.6 × 106.7 cm. Digital image courtesy of National Maritime Museum, Greenwich, London, UK (BHC1827).

The impetus for this technical change on paintings quite close in date is difficult to determine with certainty. One possible explanation is that the artist was working without a workshop in England, or perhaps with just one or two assistants, and therefore wanted to make the painting process more immediate. Little is known about Canaletto's workshop in either Venice or England. He had the assistance of his talented nephew Bernardo Bellotto from the mid-1730s until his departure for England, when Bellotto began painting in northern Europe.<sup>67</sup> The master maintained strict control of the output of his workshop and it is therefore very difficult to identify the hand of assistants on the surface of his works.

However, the highly refined detailing of the paintings from the mid-1730s to the first half of the 1740s suggests that he did run a small workshop in Venice where assistants would have been involved in the preparation of canvas and the meticulous repetition of the refining process.<sup>68</sup> The incision lines in *A Regatta on the Grand Canal*, which outline the boundaries of windows, may have functioned to indicate where an assistant could meticulously paint each window. Further, the earliest paintings, from before Bellotto and other assistants entered the studio, do not have the same extensive incision lines. A painting from Hampton Court, *Venice: the Grand Canal looking North from the Rialto*, was initially painted as part of a series for Joseph Smith in 1726–27 and shows little evidence of this process. However, Smith’s home, which is pictured in the scene, was remodelled in 1751 and Smith asked the artist to rework this area of the painting.<sup>69</sup> This area alone uses incision lines to model the form of the building, suggesting that it was a process he developed while he was painting with assistants (fig. 35).



Figure 35

Detail of Consul Smith’s home showing extensive incising, Giovanni Antonio Canal (Canaletto), *Venice: the Grand Canal Looking North from the Rialto*, circa 1726–27, oil on canvas, 47.9 × 80.0 cm. Digital image courtesy of Royal Collection, Hampton Court Palace, East Molesey, Surrey, UK (RCIN 406017).

Canaletto’s absence from nearly all English eighteenth-century primary sources suggests he was not well integrated into the artistic community in London. He seems to have led a rather isolated existence and was unlikely to have had a large studio. A book by Edward Edwards from 1808 claims that William James “had been a pupil or assistant to Canaletti, while he was in London”.<sup>70</sup> It is unclear what James’s role was in Canaletto’s studio, if indeed he worked closely with the Venetian. He may have been employed to help with such laborious tasks as stretching canvases and grinding pigments, but was probably less involved with the painting. Canaletto’s limited use of assistants while working in England may explain the more immediate painting process that the artist adopted during this period.

#### Compositional changes

The confident, free brushwork of Canaletto’s English paintings is striking. There is a sense of looseness and experimentation as he approached a new landscape. The pentimenti in these paintings are more visible than in his pre-England works. Such changes are evidence that he felt free to rework his composition as he painted and provide further evidence that the artist was working alone.

Notable changes to the composition during the blocking-out phase are visible in *St Paul's Cathedral*, where the perspective is altered through the lowering of a roof, and the dome and towers of the cathedral are moved slightly to the right (figs. 36, 37, 38). Similar adjustments are visible in the infrared image of *Old Walton Bridge* where the pitch of the bridge is lowered and the house in the foreground is made larger (figs. 39, 40, 41). In *Warwick Castle* changes are made to the direction of the footbridge (figs. 42, 43, 44) and to the church and houses in the background village (figs. 45, 46, 47). Smaller changes are visible on *Westminster Bridge* where the domes of the bridge are adjusted to achieve the desired perspective.



Figure 36

Giovanni Antonio Canal (Canaletto), *Diagram of changes during the blocking-out phase, infrared image, St Paul's Cathedral* (fig. 3), circa 1754, oil on canvas, 52.1 × 61.6 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.95). Digital image courtesy of Roxane Sperber.



Figure 37

Giovanni Antonio Canal (Canaletto), *St Paul's Cathedral*, circa 1754, oil on canvas, 52.1 × 61.6 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.95).

Figure 38

Giovanni Antonio Canal (Canaletto), *Diagram of changes during the blocking-out phase, infrared image, St Paul's Cathedral* (fig. 3), circa 1754, oil on canvas, 52.1 × 61.6 cm. Yale Center for British Art, New Haven, Connecticut (B1976.7.95). Digital image courtesy of Roxane Sperber.



Figure 39

Diagram of changes during the blocking out phase, infrared image, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Yale Center for British Art, New Haven, Connecticut (B1981.25.86). Digital image courtesy of Roxane Sperber.



Figure 40

Detail of bridge, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1981.25.86).

Figure 41

Diagram of changes during the blocking out phase, infrared image, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Yale Center for British Art, New Haven, Connecticut (B1981.25.86). Digital image courtesy of Roxane Sperber.



Figure 42

Diagram of changes to footbridge, infrared image, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Yale Center for British Art, New Haven, Connecticut (B1994.18.2). Digital image courtesy of Roxane Sperber.



Figure 43

Detail of footbridge, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1994.18.2).

Figure 44

Diagram of changes to footbridge, infrared image, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Yale Center for British Art, New Haven, Connecticut (B1994.18.2). Digital image courtesy of Roxane Sperber.



Figure 45

Diagram of changes to village buildings, infrared image, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Yale Center for British Art, New Haven, Connecticut (B1994.18.2). Digital image courtesy of Roxane Sperber.



Figure 46

Details of village buildings, infrared image, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1994.18.2).

Figure 47

Diagram of changes to village buildings, infrared image, Giovanni Antonio Canal (Canaletto), *Warwick Castle* (fig. 4), 1748–49, oil on canvas, 72.4 × 119.9 cm. Yale Center for British Art, New Haven, Connecticut (B1994.18.2). Digital image courtesy of Roxane Sperber.

Additionally, the artist frequently adjusted the edges of buildings, moving them slightly in one direction or another. Much like in his Venetian works, he would first block in the sky, leaving a reserve for the prominent elements of the composition. However, after blocking in the buildings,

foreground, and water, it seems he would sometimes then go back and extend the edges of the buildings to create crisp forms. This type of reworking is visible on *St Paul's Cathedral* (fig. 48) and *Greenwich Hospital from the North Bank of the Thames* (fig. 49), and shows the artist was freely moving around the canvas as he worked, assessing and reassessing the compositional arrangement.



Figure 48

Detail of adjustment of edge of building, Giovanni Antonio Canal (Canaletto), *St Paul's Cathedral* (fig. 3), circa 1754, oil on canvas, 52.1 × 61.6 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.95).



Figure 49

Detail of adjustment of edge of building, Giovanni Antonio Canal (Canaletto), *Greenwich Hospital from the North Bank of the Thames* (fig. 34), circa 1750–52, oil on canvas, 68.6 × 106.7 cm. Digital image courtesy of National Maritime Museum, Greenwich, London, UK (BHC1827).

## A changing palette

### Application of colour

Canaletto's palette is often described as typical of the eighteenth century. Technical studies of the artist's Venetian palette have identified a consistent range of pigments including Prussian blue, lead white, charcoal black, bone black, Naples yellow, ochre and umber earth pigments, vermilion, red lead,<sup>71</sup> red lake, and green earth.<sup>72</sup> However, the way the artist mixed and applied his colour was very specific and his manipulation of materials exquisitely precise.

Canaletto is known to be an early adopter of Prussian blue.<sup>73</sup> In a letter from 1725, Alessandro Marchesini wrote to Stefano Conti to explain why Canaletto was delayed in finishing Conti's commission, and cites the inability to procure large quantities of that artist's preferred blue pigment due to its high cost.<sup>74</sup> This has been construed as procrastination on the part of the artist or a ploy to demand more money. However, as Bomford and Finaldi argue, it is very possible that in 1725 obtaining large quantities of Prussian blue would have been difficult.<sup>75</sup> What is more, Canaletto's willingness to delay a commission in order to obtain his choice material illustrates the artist's specificity in his pigment selection.



Figure 50

Detail of figure with yellow buttons, Giovanni Antonio Canal (Canaletto), *The Thames from the Terrace of Somerset House, Looking toward St Paul's* (fig. 5), circa 1750, oil on canvas, 38.6 × 72.9 cm. Digital image courtesy of Yale Center for British Art, New Haven, Connecticut (B1976.7.96).

Canaletto's deliberate application of yellow further exemplifies this precision. In *The Thames . . . Looking toward St Paul's*, the golden yellow vest of a man standing on the terrace is painted with yellow ochre, but the sparkling highlights on his buttons are articulated with the addition of the Naples yellow, a brighter, more vibrant yellow pigment (fig. 50). Rather than simply adding white to the yellow ochre to create a highlight, the Naples yellow functions to imitate gold buttons. A splash of yellow in the distance, on the top of the dome of St Paul's, also contains a high proportion of Naples yellow and draws the eye to this feature in the distance.<sup>76</sup>

Bomford and Roy observed a similar use of Naples yellow and yellow ochre in the *Stone Mason's Yard*, from about 1725, and *The Feast Day of S. Roch*, from about 1735.<sup>77</sup> Pure Naples yellow was found to be used unmixed for the touches of colour on clothing and highlights on buildings.<sup>78</sup> In *San Simone Piccolo*, the mid-yellow drape in the window of a building was

identified as pure Naples yellow, while the decoration on the barge was painted in a mix of yellow ochre and Naples yellow.<sup>79</sup> In her technical study, Pamela England identified the deliberate use of "all the readily available red pigments, sometimes mixed together in varying proportions or used along with white".<sup>80</sup>

The implications of changing pigments

Canaletto's use of colour is one the most engaging aspects of his paintings. His Venetian views are easily recognized by their wide-open expanses of blue sky and sparkling blue-green water separated by carefully articulated dusty buildings. The series of Venetian views commissioned by Lord John Russell, 4th Duke of Bedford, on his Grand Tour to Venice in 1731, exemplifies the consistent colour mixtures of Canaletto's pre-England period.<sup>81</sup> Twenty-one of the twenty-four paintings, in the collection of the current Duke of Bedford, hang in the dining room at Woburn Abbey. While stunning, observing so many of the artist's canvases in a domestic space emphasizes their tonal repetition.<sup>82</sup> Indeed, the artist's system of colour mixing was so well established by the late 1720s that the colour combinations in the paintings from the following decade appear somewhat formulaic.<sup>83</sup>

When he came to England, Canaletto was faced with a different landscape. The lush green hillsides illuminated by diffuse light stood in sharp contrast to the bright sun and dusty streets of Venice. Changes to the artist's palette are apparent in the mixtures of colour, particularly in his approaches to painting water and foliage. Perhaps the most significant change is the introduction of the copper-containing blue verditer as a replacement for the vibrant green earth pigments that were not readily available in England.

It is generally held that upon arrival in England Canaletto did not have commissions secured and thus he went about attempting to procure work.<sup>84</sup> The completion of *Westminster Bridge* (fig. 1)

is cited as one of the reasons for Canaletto's travel to England.<sup>85</sup> Indeed, Vertue tells us that the artist was persuaded to go to London by Jacopo Amigoni, who had recently returned to Venice.<sup>86</sup> Amigoni enticed Canaletto by telling him "of the prospects he might make of Views of the Thames".<sup>87</sup>

Charles Beddington has argued that the provenance of *Westminster Bridge*, sold by John Carpenter Garnier from the collection of Rookesbury Park in 1895, suggests that the painting had been housed in the Garnier family collection since the time of George Garnier (1703–1763) and was likely commissioned by him.<sup>88</sup> George Garnier probably ordered three Venetian views from Canaletto while in Venice during the first half of the 1740s.<sup>89</sup> In 1745–46, shortly before his departure to England, Canaletto painted the final painting in the Garnier commission, *The Molo from the Bacino di San Marco on Ascension Day, with the Bucintoro* (fig. 24).<sup>90</sup> Beddington suggests that Canaletto may have also had a request from Garnier to paint the new *Westminster Bridge* and that it was this commission that brought the artist to England.<sup>91</sup>

Technical study of *Westminster Bridge* has revealed supporting evidence for this theory. When compared to Canaletto's other English paintings, *Westminster Bridge* stands apart. Indeed, the work has long been criticized for its decorative qualities and regarded as a product of Canaletto's tendency to paint England like Venice.<sup>92</sup> While the paint handling does not closely relate to the artist's Venetian style, the colour combinations do.

X-ray fluorescence spectroscopy (XRF) analysis of the pigments in the blue-green water from the Venetian scene, *The Molo from the Bacino di San Marco on Ascension Day*, identified the presence of iron and the absence of copper.<sup>93</sup> This suggests that the vibrant blue-green water was achieved through a mixture of predominantly blue-green earth pigments. The same combination has been found in other studies of Canaletto's Venetian painting.<sup>94</sup>

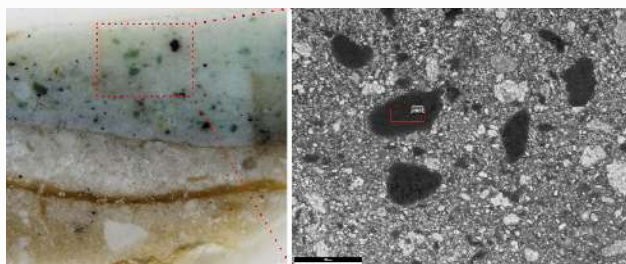


Figure 51

Detail of cross-section showing blue-green particle, visual light (left), SEM backscattered image ©, Giovanni Antonio Canal (Canaletto), *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (fig. 1), 1747, oil on canvas, 95.9 × 127.6 cm. Yale Center for British Art, New Haven, Connecticut. (B1976.7.94). Digital image courtesy of Roxane Sperber.

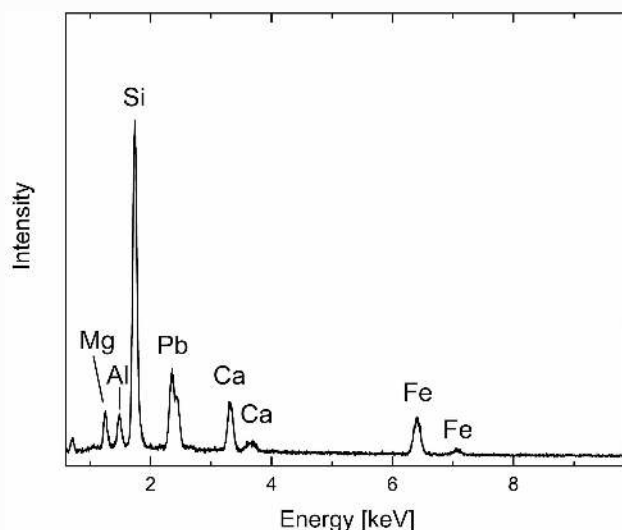


Figure 52

EDX spectrum of blue-green particle 1, showing peaks for iron (Fe), silicon (Si), aluminium (Al), magnesium (Mg), and potassium (K) but no copper (Cu). Digital image courtesy of the Institute for the Preservation of Cultural Heritage (IPCH).

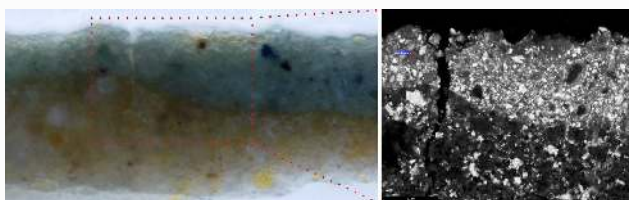


Figure 53

Detail of cross-section showing light blue particle, visual light (l), SEM backscattered image @, Giovanni Antonio Canal (Canaletto), *Old Walton Bridge* (fig. 2), 1755, oil on canvas, 46 × 122.2 cm. Yale Center for British Art, New Haven, Connecticut (B1981.25.86). Digital image courtesy of Roxane Sperber.

Cross-section samples in combination with XRF analysis of *Westminster Bridge* found the blues and greens of the water, foliage, and boats to be consistent with the pigment combinations of Canaletto's Venetian palette.<sup>95</sup> Unlike the other works in the YCBA collection, *Westminster Bridge* contains no copper blue pigments. Rather, much like the artist's Venetian paintings, the water in *Westminster Bridge* is composed of blue-green earth particles, lead white, bone black, and Naples yellow (figs. 51, 52). It is also possible that some Prussian blue was added, but this could not be confirmed using Energy Dispersive X-ray (EDX) or XRF analysis.<sup>96</sup>

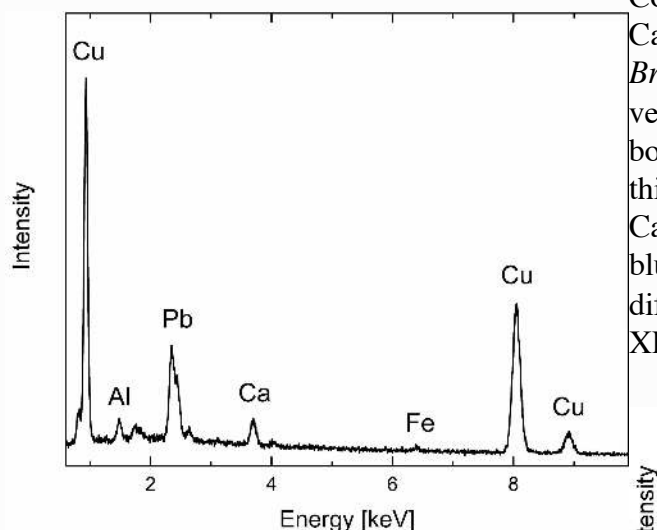


Figure 54

EDX spectrum of blue-green particle 1, showing peaks for copper Cu. Digital image courtesy of the Institute for the Preservation of Cultural Heritage (IPCH).

Contrastingly, a cross-section of the water in Canaletto's last English painting, *Old Walton Bridge* (fig. 2), is composed primarily of blue verditer and lead white with a small amount of bone black (figs. 53, 54). The visual effect of this change of pigments is not that dramatic. Canaletto succeeds in achieving his signature blue-green water, but does so using very different pigments (see fig. 55 for comparison of XRF spectra).

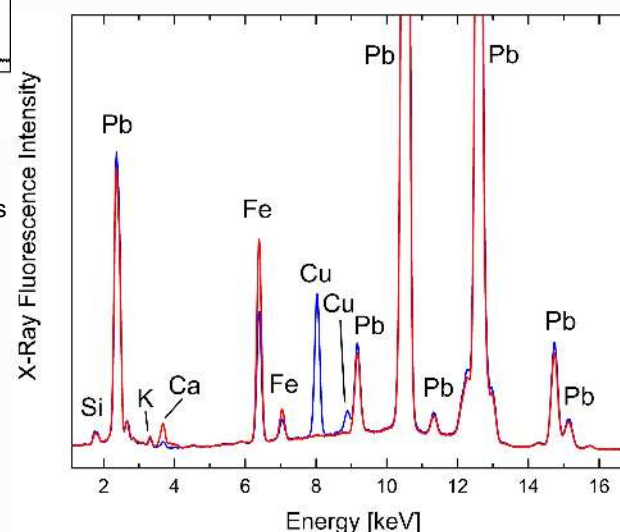


Figure 55

Comparison of X-ray fluorescence spectra of water passages in *Westminster Bridge* (blue line). The spectra are very similar and dominated by the lead (Pb) peaks generated by the presence of lead white (basic lead carbonate). Other elements detected in both measurements are iron (Fe), calcium (Ca), potassium (K), and silicon (Si). Copper (Cu) only appears in *Old Walton Bridge* suggesting the presence of a copper-based blue such as verditer. Westminster Bridge contains more iron in the measured locations which is consistent with additional iron-based pigment such as green earth. Digital image courtesy of the Institute for the Preservation of Cultural Heritage (IPCH).

Given the consistency with which Canaletto used blue-green earth pigments to paint the canals of Venice, and that he uses the same pigment in his first London view, it is unlikely that the artist would willingly abandon this pigment. Rather, Canaletto probably came to England with the pigments required to paint his first commission, Garnier's depiction of Westminster Bridge, but soon ran out of his precious blue-green earth.

Eighteenth-century customs records reveal that green earth pigments were not widely available in England at this time, although the pigment was growing in popularity.<sup>97</sup> What was available was described by Dossie as blue-green in colour, but not very bright, and semi-transparent in oil.<sup>98</sup> Without access to the vibrant blue-green earths from Venice, Canaletto would have felt it

necessary to supplement his pigment box. The addition of blue verditer can thus be explained as an effort to supplement and enrich his range of colours.

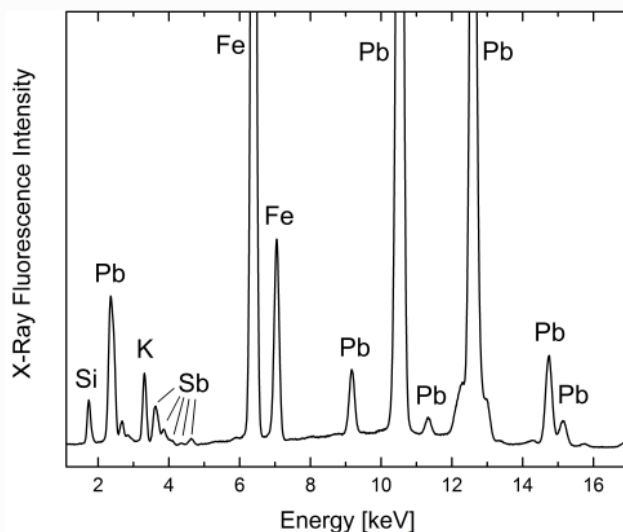


Figure 56

X-ray fluorescence spectrum of foliage in *Westminster Bridge*. The presence of lead (Pb), iron (Fe), silicon (Si), potassium (K), and antimony (Sb) suggests a pigment combination of lead white (basic lead carbonate), earths, and Naples yellow (lead antimonite). Digital image courtesy of the Institute for the Preservation of Cultural Heritage (IPCH)

Consistency in the pigment combination with Canaletto's Venetian paintings can also be found in the areas of foliage in *Westminster Bridge*. No other cross-sections were taken, but XRF analysis revealed peaks for lead, iron, antimony, potassium, and silicon (see fig. 56 for XRF spectra). Although it is impossible to say for certain without a cross-section, this suggests that the foliage was painted using a combination of lead white, green earth, and Naples yellow. A sample from an area of green grass in the *Stone Mason's Yard* found this same combination of pigments. Similarly, this combination was found in a swag over the church door in *The Feast Day of S.*

*Roch.*<sup>99</sup> Although not confirmed by elemental analysis, a visually similar example of this pigment combination can be found in a cross-section sample (fig. 7) from *Venice: the Piazzetta towards S. Giorgio Maggiore* (fig. 20). In fact, studies from the artist's Venetian palette found the only green pigment present in paintings to be a vibrant green earth composed

of the mineral glauconite.<sup>100</sup>

Even in comparison to green earth of the early Italian period, the green earth found in Canaletto's Venetian painting was extremely powerful in tone.<sup>101</sup> This vibrant pigment seems to be a feature of Italian paintings of the seventeenth and eighteenth centuries, leading Bomford and Roy to conclude that improved supplies would have been available to Italian artists by the seventeenth century.<sup>102</sup> Indeed, the most famous historical source for this pigment is near Verona.<sup>103</sup>

The extensive mining practices of this region, as well as the many colour varieties of rock, are discussed in an article from 1820 by Giovanni de Brignoli de Brunnhoff.<sup>104</sup> Brignoli de Brunnhoff argues that the earliest mention of the substance was from 1574, when Mercati describes the substance called *creta verdis, acris, lapidosa, ex agro Veronensi* in the Vatican catalogue.<sup>105</sup> Brignoli de Brunnhoff's assertion that Veronese mines were in existence by 1574 would explain why the green earth pigments of seventeenth- and eighteenth-century Italian painting are more vibrant than those of the fourteenth- and fifteenth-century Italian works. Regardless, the pigments used to create passages of green in Canaletto's Venetian period sharply contrast with the pigments found in green areas of his English paintings. Cross-section samples from the grass in *Warwick Castle* (fig. 12) and *Old Walton Bridge* (fig. 13) revealed complicated mixtures of green earth, copper-containing blue verditer, iron-earth ochres which are yellow and orange in colour, black, lead white, and vermilion.

The green earth pigments in these mixtures are duller in colour than the green earths in the Venetian paintings. Canaletto's addition of yellow earths and blue verditer was probably an effort to enrich the appearance of the dull green earth pigments. The addition of vermilion to mixtures

of green would have allowed the artist to achieve varying tones of greenish-brown. Such variety would have been necessary for painting the English landscape with its wide variety of green hues.

## Conclusion

From a technical point of view, the changes to Canaletto's painting technique while working in England can be seen as a reaction to a range of influences. He likely regarded the availability of commercially prepared canvas with a light ground as a convenience in his new city, and immediately began to use this material. Meanwhile, the dearth of a wide range of green earth pigments was an obstacle he remedied through the introduction of a new blue pigment.

Technical changes were also made as a reaction to painting in a new environment with different commercial demands and a smaller studio. He appears to have simplified his paint application process, taking on a more immediate approach, and was apt to alter and change his composition during the painting process, probably as a reaction to painting without the aid of assistants. This geographical relocation, and the implications that came with it, led to a changing aesthetic that was not always well received. While technical changes to the artist's ground, palette, and painting process result in a different aesthetic from his much-beloved Venetian views, this period was one of experimentation and evolution for the well-established Canaletto.

Freed from the overwhelming market pressures of tourists to Venice, he was able to explore a new landscape. Canaletto's English paintings provide us with a fascinating glimpse into the essence of the artist's method and his continued willingness to adapt and change. To view these works as of lesser quality is to miss the most appealing aspect of their nature, the immediacy and confidence of an artist with great technical skill and a penchant for experimentation.

## Appendix

### X-ray fluorescence spectroscopy (XRF)

X-ray fluorescence spectroscopy is a nondestructive analytical technique for elemental analysis. The fluorescence is excited by X-rays and the X-ray emission spectrum is characteristic for the chemical elements present.

A Bruker Artax XRF spectrometer equipped with a rhodium X-ray tube was used. The area of examination was flushed with helium gas to improve the detection efficiency of lighter elements. The measurements were run at 45 kV, 300  $\mu$ A, for 120 seconds.

### Scanning electron microscopy—energy dispersive X-ray spectroscopy (SEM/EDX)

Scanning electron microscopy uses a focused electron beam to interact with a sample and has a higher resolving power compared to optical microscopy. A backscatter image is generated by recording electrons scattered off the surface. The contrast is based on the interactions with different chemical elements. Heavy, high atomic number elements, for example lead, scatter more and appear lighter in the image; low atomic number elements appear darker. The interaction of the electron beam with the sample also generates fluorescence X-rays which are characteristic for the chemical elements present, similar to XRF.

A Zeiss EVO MA 15 variable-pressure SEM equipped with a tungsten filament emission system was used for imaging at chamber pressures between 40 and 60 Pa, achieved by bleeding nitrogen gas into the chamber. Backscattered electron images were acquired with four quadrants of a lens-mounted five-channel diode-based detector. Elemental analysis was performed using an EDAX

energy-dispersive X-ray spectrometer with an Octane silicon drift detector. The analysis was carried out at an 8.5 mm working distance, using 20 or 22 kV accelerating potential.

#### Fourier transform infrared spectroscopy (FTIR)

Fourier transform infrared spectroscopy is an analytical technique that is used to identify a variety of materials including binding media, pigments, and fillers in paint. It detects vibrations of atomic groups in molecules. The set of vibrations are characteristic for a specific compound. Samples were flattened on a diamond window and measured in transmission using a Thermo Continuum infrared microscope coupled to a Nicolet 6700 bench-top spectrometer. A liquid nitrogen-cooled mercury cadmium telluride detector recorded the spectrum between 4000 and 650  $\text{cm}^{-1}$  at 4  $\text{cm}^{-1}$  resolution. Results were examined and compared to spectral reference libraries.

#### Raman spectroscopy

Raman spectroscopy records the wavelength and intensity of light that is inelastically scattered from a sample. The wavelength shifts between the laser excitation and the scattered light corresponds to the energies of Raman active vibrations of molecular compounds present which serve as a signature in their identification.

A Bruker Senterra Raman spectrometer was used to acquire spectra with excitations at 532 nm, 633 nm, and 785 nm at 2 mW nominal laser power. Spectra were examined and compared with reference data."

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## Footnotes

1. George Vertue, "Vertue's Note Books: Volume III", *The Walpole Society* 22 (1933–34): 130.
2. The exact date that Canaletto left England is uncertain, but he was back in Venice by 12 Dec. 1755. Charles Beddington, ed., *Canaletto in England: A Venetian Artist Abroad, 1746–1755* (New Haven and London: Yale Univ. Press, 2006), 9–10.
3. M. J. H. Liversidge, "Canaletto and England", in *Canaletto & England*, ed. Michael Liversidge and Jane Farrington (London: Merrell Holberton in association with Birmingham Museums and Art Gallery, 1993), 9.
4. Vertue, "Vertue's Note Books", 130.
5. Vertue, "Vertue's Note Books", 149.
6. This rumour was reported by Vertue in 1749. Vertue, "Vertue's Note Books", 149.
7. Vertue writes: "young stripling by degrees came on forward in his profession being taken notice of for his improvements he was calld Canaletti- the young, but in time getting some degree of merrit. he being puffd up disoblighd his Uncle who turnd him adrift, but well Imitating his uncles manner of painting became reputed and the name of Canaletti was indifferently used by both uncle and nephew." Vertue, "Vertue's Note Books", 151.
8. For full discussion of this, see Hilda F. Finberg, "Canaletto in England", *The Walpole Society* 9 (1920–21): 33.
9. Liversidge, "Canaletto and England", 10, and Beddington, ed., *Canaletto in England*, 21. Jacopo Amigoni faced similar resentment from English artists who attempted to publicly discredit him. Leslie Griffin Hennessey, "Friends Serving Itinerant Muses: Jacopo Amigoni and Farinelli in Europe", in *Italian Culture in Northern Europe in the Eighteenth Century*, ed. Shearer West (Cambridge: Cambridge Univ. Press, 1999), 38.
10. Beddington, ed., *Canaletto in England*, 9.
11. Brian Allen, "The London Art World of the Mid-Eighteenth Century", in *Canaletto in England: A Venetian Artist Abroad, 1746–1755*, ed. Charles Beddington (New Haven and London: Yale Univ. Press, 2006), 32.
12. E. W. Bradley, *The work of the Late Edward Dayes . . .* (London: T. Maiden, 1805), 322.
13. Giuseppe Fiocco, *Venetian Painting of the Seicento and Settecento* (New York: Harcourt, Brace and Company, 1929), 65.
14. W. G. Constable, revised by J. G. Links, *Canaletto: Giovanni Antonio Canal*, 2nd ed., 2 vols. (Oxford: Clarendon Press, 1976), 1:139.
15. Viola Pemberton-Pigott has conducted the most thorough technical examination of Canaletto's painting over his career. Viola Pemberton-Pigott, "The Development of

- Canaletto's Painting Technique", in *Canaletto*, ed. Katharine Baetjer and J. G. Links (New York: Metropolitan Museum of Art, 1989), 53–64. For information on Canaletto's Venetian technique, see David Bomford and Gabriele Finaldi, "Technique and Style of Canaletto Paintings", in *Venice through Canaletto's Eyes* (London: National Gallery, 1998).
16. No technical studies have hitherto focused on Canaletto's English period. For technical literature on his Venetian painting, with cursory study of his English period, see Pamela England, "An Account of Canaletto's Painting Technique", in *Canaletto Paintings and Drawings in the Queen's Gallery, Buckingham Palace, 1980–81* (London, 1980), 27–28; David Bomford and Ashok Roy, "Canaletto's 'Venice: The Feastday of S. Roch'", *National Gallery Technical Bulletin* 6 (1982): 40–43; Ludovico Mucchi and Alberto Bertuzzi, *Nella Profondita' dei Dipinti: La Radiografia nell'Indagine Pittorica* (Milan: Electa, 1983); Keith Laing, "Canaletto: Campo SS. Giovanni e Paolo", in *The First Ten Years: The Examination and Conservation of Paintings, 1977 to 1987, Bulletin of the Hamilton Kerr Institute* 1 (1988): 96–98; Pemberton-Pigott, "Development of Canaletto's Painting Technique", 53–64; David Bomford and Ashok Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", *National Gallery Technical Bulletin* 14 (1993): 34–41; Bomford and Finaldi, *Venice through Canaletto's Eyes*, 54–61; Viola Pemberton-Pigott, "Canaletto 'prima maniera': Tradizione e innovazione nelle tecniche pittoriche degli esordi di Canaletto", in *Canaletto Prima Maniera*, ed. Anna Kowalczyk Bożena (Milan: Electa, 2001), 207–17; and Elise Effmann, "View of the Molo: A Canaletto Attribution Reinstated", in *Studying and Conserving Paintings: Occasional Papers on the Samuel H. Kress Collection*, ed. New York University, Institute of Fine Arts, Conservation Center (London: Archetype, 2006), 189–95.
  17. The YCBA paintings studied were: *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (B1976.7.94), *Old Walton Bridge* (B1981.25.86), *St Paul's Cathedral* (B1976.7.95), *Warwick Castle* (B1994.18.2), *The Thames from the Terrace of Somerset House, Looking toward St Paul's* (B1976.7.96), and *The Thames from the Terrace of Somerset House, Looking toward Westminster* (B1976.7.97).
  18. Pemberton-Pigott, "Development of Canaletto's Painting", 63.
  19. Rica Jones, "The Artist's Training and Techniques", in *Manners & Morals: Hogarth and British Painting, 1700–1760*, ed. Elizabeth Einberg (London: Tate Gallery, 1988), 24.
  20. Thomas Bardwell, *The Practice of Painting and Perspective Made Easy . . .* (London: S. Richardson, 1756), 5–6, <http://archive.org/details/practiceofpainti00bard>.
  21. Rica Jones, "Gainsborough's Materials and Methods: A 'Remarkable Ability to Make Paint Sparkle'", *Apollo* 146 (1997): 19.
  22. Rica Jones, "Thomas Gainsborough: The Rev. John Chafy Playing the Violoncello in a Landscape, c. 1750–2", in *Paint and Purpose: A Study of Technique in British Art*, ed. Stephen Hackney, Rica Jones, and Joyce Townsend (London: Tate Gallery, 1999), 48.
  23. *The Excellency of the pen and pencil . . .* (London: Thomas Ratcliff and Thomas Daniel for Dorman Newman and Richard Jones, 1668), 92, <http://hdl.handle.net/2027/gri.ark:/13960/t3cz46h2c>.
  24. Robert Dossie, *The Handmaid to the Arts*, 2nd ed., vol. 1 (London: Printed for J. Nourse, 1764), 217, <http://archive.org/details/handmaidtoarts01doss>.
  25. EDX analysis of cross-sections from *The Thames from the Terrace of Somerset House, Looking toward St Paul's, Old Walton Bridge*, and *Warwick Castle* found elements to suggest the ground was composed primarily of lead white and calcium carbonate (chalk) with small amounts of iron earth pigments (yellow and red in colour) and carbon black. *Warwick Castle*

also contained small amounts of manganese suggesting the inclusion of an umber pigment. *Westminster Bridge, with the Lord Mayor's Procession on the Thames* (B1976.7.94) was composed of lead white and calcium carbonate (chalk) with small amounts of carbon black but no earth pigments. *St Paul's Cathedral* and *The Thames from the Terrace of Somerset House, Looking toward Westminster* (B1976.7.97) were not analysed using EDX, but are visually consistent with the other paintings.

26. This study examined the six painting from the YCBA collection as well as *Greenwich Hospital from the North Bank of the Thames* from the National Maritime Museum, London. The *Interior of the Rotunda, Ranelagh* from the National Gallery, London, is also described in the conservation file as having a "light ground". Pemberton-Pigott has found that *London: Westminster Abbey with a Procession of Knights of the Order of the Bath*, in the collection of the Dean and Chapter of Westminster, also has a grey ground. Pemberton-Pigott, "Development of Canaletto's Painting", 63, note 12.
27. Pemberton-Pigott, "Canaletto 'prima maniera'", 209.
28. Engravings after the YCBA paintings were made by Edward Rooker and Johann Sebastian Müller and published on 20 Aug. 1750. Both are inscribed "Canaletto Pinx<sup>t</sup> in the Collection of M<sup>r</sup>. Tho<sup>s</sup> West". Beddington, ed., *Canaletto in England*, 62–63.
29. Beddington, ed., *Canaletto in England*, 67.
30. I will use the term *imprimatura* to refer to a paint layer that was applied over the commercially prepared ground by the artist.
31. Pemberton-Pigott, "Canaletto 'prima maniera'", 217, note 8.
32. The other three paintings had their tacking margins removed during the lining process.
33. Leslie Carlyle, *The Artist's Assistant: Oil Painting Instruction Manuals and Handbooks in Britain, 1800–1900, With Reference to Selected Eighteenth-century Sources* (London: Archetype, 2001), 447.
34. Jones, "Artist's Training and Techniques", 24.
35. Quoted in William T. Whitley, *Artists and their Friends in England, 1700–1799*, 2 vols. (London: Medici Society, 1928), 1:332.
36. Laughton Osborne, *Handbook of Young Artists and Amateurs in Oil Painting* (New York: John Wiley & Sons, 1876), 114.
37. Vertue, "Vertue's Note Books", 151. There is a blue plaque marking the home of Canaletto at 41 Beak Street.
38. Louise Lippincott, *Selling Art in Georgian London: The Rise of Arthur Pond* (New Haven and London: Yale Univ. Press, 1983), 15.
39. Jacob Simon's encyclopedic directory of British arts suppliers lists ten colourmen in operation in London during Canaletto's ten-year stay. Matthew Bateman, David Bellis, William De La Cour, William Dicker, Nathan Drake, Alexander Emerton & Co, Robert Keating, Edward Powell Jr., James Regnier, and Lawrence Smith were located within walking distance of Silver Street. Walking times are estimated using a map of current day London and Google walking directions. Jacob Simon, "British Artists' Suppliers, 1650–1950", National Portrait Gallery website last updated March 2016:  
<http://www.npg.org.uk/research/programmes/directory-of-suppliers.php>.
40. Martina Manfredi, "Jacopo Amigoni: A Venetian Painter in Georgian London", *The Burlington Magazine* 147 (2005): 677.
41. Manfredi, "Jacopo Amigoni", 677.
42. Lippincott, *Selling Art in Georgian London*, 92.

43. Vertue, "Vertue's Note Books", 151.
44. Bożena Anna Kowalczyk, *Canaletto: Rome, Londres, Venise: Le triumphe de la Lumière* (Brussels: Fonds Mercator, 2015), 50–55.
45. Effmann, "View of the Molo", 190.
46. Cross-section samples show that during this early period Canaletto occasionally applied a light *imprimatura* over the dark red ground to selected areas of the sky, buildings, or water. England, "Canaletto's Painting Technique", 27.
47. These paintings must date from before 1726–28 when the crowning element of the campanile was altered from conical to onion shape. See "Venice: The Piazzetta towards S. Giorgio Maggiore", The Royal Collection Trust:  
<https://www.royalcollection.org.uk/collection/search#/1/collection/401036/venice-the-piazzetta-towards-s-giorgio-maggiore>.
48. Joseph Smith was named the British Consul in Venice from 1744. "Venice: The Piazzetta towards S. Giorgio Maggiore", The Royal Collection Trust:  
<https://www.royalcollection.org.uk/collection/search#/1/collection/401036/venice-the-piazzetta-towards-s-giorgio-maggiore>.
49. Claire Chorley, paintings conservator at the Royal Collection, first brought this technical aspect of this painting to the authors' attention.
50. Pemberton-Pigott, "Development of Canaletto's Painting", 63.
51. Bomford and Finaldi, *Venice through Canaletto's Eyes*, 55.
52. Bomford and Finaldi, *Venice through Canaletto's Eyes*, 55.
53. The Canaletto paintings from the Royal Collection that are housed at Hampton Court display many of his earliest techniques, but also exhibit technical elements he would develop as he progressed.
54. Beddington, ed., *Canaletto in England*, 18.
55. Waldemar Januszczak, "Forget Venice. London brought the best out of Canaletto", *The Sunday Times*, 28 Jan. 2007.
56. J. G. Links, *Canaletto and his Patrons* (London: Paul Elek, 1977), 45–46.
57. This was the case with the paintings studied at the YCBA. See also Pemberton-Pigott, "Canaletto 'prima maniera'", 215.
58. It should be noted that several studies of Bernardo Bellotto's painting have found evidence of underdrawing and squaring up. For this, see Bettina Schwabe, "Vanishing Point and Grid of Threads: *Nymphenburg Palace from the Park*—The Construction of the Picture", and Bożena Anna Kowalczyk, "Bernardo Bellotto as Landscape Painter", both in *Canaletto: Bernardo Bellotto Paints Europe*, ed. Andreas Schumacher (Munich: Hirmer, 2014), 334–43 and 72–95 respectively. Because Bellotto was trained by Canaletto, and uses many of his pictorial techniques, it is Kowalczyk's belief that Canaletto also used underdrawing. Personal communication with Bożena Anna Kowalczyk, April 2015.
59. Effmann, "View of the Molo", 190. *View of the Molo* is in the Colombia Museum of Art (CMA 1954\*\*. \*\*44).
60. Effmann, "View of the Molo", 190.
61. It was Claire Chorley who first pointed out this aspect of the artist's work and suggested this possibility.
62. Canaletto's drawings from his notebooks are very loose and sketchy and were probably made on site. It seems that these sketches were then used to make more finished drawings complete with shading. Finished drawings appear to have been used to show clients. Hilda Finberg

argues that Thomas Hollis chose the subject of six paintings he commissioned, including *St Paul's Cathedral*, from the artist's drawings. Finberg, "Canaletto in England", 41. Pellegrino Antonio Orlandi, writing in 1753, also notes that Canaletto brought finished sketches of views of London when he returned to Venice in 1750–51, in order to translate the drawings onto canvas. Pellegrino Antonio Orlandi, *Abecedario pittorico del M.R.P.* (Venezia: Apresto Giambatista Pasquali, 1753), 76, <http://hdl.handle.net/2027/gri.ark:/13960/t5s78556z>. Another example of a finished work that was probably used as a reference for a painting is *Old Somerset House from the River Thames* from the YCBA collection (B1977.14.6111).

Beddington argues that refinements in the painting demonstrate that the artist was working from the drawing. See Beddington, ed., *Canaletto in England*, 75. Other finished drawings were made after paintings and then used by an engraver. The drawing *Old Walton Bridge*, from the YCBA collection (B1981.25.2409), was made after the painting by the same title (fig. 2). An inscription on the drawing by Canaletto reads: "Disegnato da me Antonio Canal detto il Canaletto appresso il mio Quadro Dippinto in Londra 1755", which makes clear the fact that the drawing was made after the painting. An engraving by Anthony Walker, also in the YCBA collection, was published in 1750.

63. For studies by other authors regarding order of painting, see England, "Canaletto's Painting Technique", 27; Pemberton-Pigott, "Development of Canaletto's Painting", 63; and Laing, "Canaletto: *Campo SS. Giovanni e Paolo*", 96.
64. James Taylor, *Marine Painting: Images of Sail, Sea and Shore* (London: Studio Editions, 1995), 52.
65. Jane Dacey, "A Note on Canaletto's Views of Greenwich", *The Burlington Magazine* 123 (1981): 486.
66. Beddington, ed., *Canaletto in England*, 50.
67. Constable and Links, *Canaletto*, 1:117.
68. Mucchi and Kowalczyk suggest that Canaletto was using a larger workshop than just Bellotto when working in Venice. Mucchi and Bertuzzi, *Nella Profondita' dei Dipinti*, 63, and Bożena Anna Kowalczyk, "Canaletto e Bellotto: l'arte della veduta", in *Canaletto e Bellotto L'arte della veduta*, ed. Bożena Anna Kowalczyk (Milan: Silvana Editoriale, 2008), 13. *Pentimenti* in Canaletto's earliest works has led Elise Effmann to conclude that he did not use a workshop at that point in his career. Effmann, "View of the Molo", 193–94.
69. Martin Clayton, *Canaletto in Venice* (London: Royal Collection, 2005), 44.
70. Edward Edwards, *Anecdotes of Painters who Have Resided or Been Born in England* (London: Leigh and Sotheby, 1808), 27, <http://hdl.handle.net/2027/uc1.b4422792>. Although Edwards is vague about James's role in Canaletto's studio, this early primary source suggests it may indeed be true. Charles Beddington supports the suggestion that there was a single assistant in London who helped Canaletto complete his considerable workload. Beddington, ed., *Canaletto in England*, 20. J. G Links, however, expresses doubt that Canaletto employed assistants in Venice. Links, *Canaletto and his Patrons*, 78.
71. England is the only author to identify red lead. The current research did not confirm this pigment in the English paintings.
72. See England, "Canaletto's Painting Technique", 27–28; Bomford and Roy, "Canaletto's 'Venice: The Feastday of S. Roch'", 40–43; Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", 34–41; and Pemberton-Pigott, "Development of Canaletto's Painting", 62–63.

73. Pemberton-Pigott, "Development of Canaletto's Painting", 62–63. Prussian blue was identified on the YCBA paintings using FTIR analysis. See Appendix for further information on FTIR device and settings used.
74. Francis Haskell, "Stefano Conti, Patron of Canaletto and Others", *The Burlington Magazine* 98 (1956): 298.
75. Bomford and Finaldi, *Venice through Canaletto's Eyes*, 55
76. Identification of the yellow pigments was carried out using X-ray fluorescence spectroscopy (XRF) analysis. See Appendix for further information on XRF device and settings used.
77. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'". 40.
78. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'". 40.
79. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'". 40.
80. England, "Canaletto's Painting Technique", 28.
81. Constable and Links, *Canaletto*, 1:111.
82. Eglin describes these works as "outstanding examples of the prettified picture postcards from which [Canaletto] is so often derided". John Eglin, "Venice on the Thames: Venetian *Vedutisti* and the London View in the Eighteenth Century", in *Italian Culture in Northern Europe in the Eighteenth Century*, ed. Shearer West (Cambridge: Cambridge Univ. Press, 1999), 104.
83. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'". 40.
84. Links, *Canaletto and his Patrons*, 64–65.
85. Beddington, ed., *Canaletto in England*, 9.
86. Vertue, "Vertue's Note Books", 132.
87. Vertue, "Vertue's Note Books", 132.
88. Beddington, ed., *Canaletto in England*, 102.
89. Beddington, ed., *Canaletto in England*, 162.
90. Beddington, ed., *Canaletto in England*, 162.
91. Beddington, ed., *Canaletto in England*, 102.
92. Beddington, ed., *Canaletto in England*, 102.
93. We are sincerely grateful to Conservator of Paintings Teresa Lignelli and Senior Scientist Beth Price at the Philadelphia Museum of Art, for carrying out this analysis at our request.
94. See, for example, England, "Canaletto's Painting Technique", 28, and Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'". 40.
95. See Appendix for further information on XRF device and settings used.
96. See Appendix for further information on SEM/EDX device and settings used.
97. R. D. Harley, *Artists' Pigments, c. 1600–1835: A Study in English Documentary Sources* (London: Butterworths, 1970), 70.
98. Dossie, *Handmaid to the Arts*, 118, <http://archive.org/details/handmaidtoarts01doss>.
99. For images of these cross-sections, see Bomford and Roy, "Canaletto's 'Venice: The Feastday of S. Roch'", 43 plate 7c, and Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", 39 plate 7.
100. England, "Canaletto's Painting Technique", 28; Bomford and Roy, "Canaletto's 'Venice: The Feastday of S. Roch'", 42; Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", 40; Pemberton-Pigott, "The Development of Canaletto's Painting", 63.
101. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", 40.
102. Bomford and Roy, "Canaletto's 'Stone Mason's Yard' and 'San Simeone Piccolo'", 40.  
Similar pigments have been found in paintings by Salvator Rosa, Bartolo de Sassoferrato, and

- Bernardo Cavallino at the National Gallery, London. Bomford and Roy, “Canaletto’s ‘Stone Mason’s Yard’ and ‘San Simeone Piccolo’”, 41 note 20.
103. Carol A. Grissom, “Green Earth”, in *Artists’ Pigments: A Handbook of their History and Characteristics*, ed. Robert L. Feller (Washington, DC: National Gallery of Art, 1986), 143.
  104. Giovanni de Brignoli de Brunnhoff, “Dissertation sur la chlorite ou terre verte de Vérone”, *Journal de physique de chimie et d’histoire* 90 (1820), 355–61, 423–42.
  105. de Brignoli de Brunnhoff, “Dissertation sur la chlorite ou terre verte de Vérone”, 356.

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