

Canaletto's Venetian Sketches and the Camera Obscura —

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The sketchbook

In 1949 Guido Cagnola presented a *quaderno*, a sketchbook, to the Gallerie dell'Accademia in Venice.¹ The book is small, measuring just 23 x 17cm. It contains some 140 pages of drawings of Venetian buildings. We know that it belonged to Antonio Canaletto (1697–1768) because the drawings correspond closely to some of his paintings.

A few pages are devoted to very rough sketches – Canaletto calls them *scaraboti* or 'scribbles' – drawn rapidly by eye or from memory, in which he seems to be exploring ideas for compositions. Fig.1 shows a 'scribble' of Jacopo Sansovino's Marciana Library with the two great columns that stand at the end of the Piazzetta, next to the Doge's Palace.²

The remainder of the book is filled with careful, accurate drawings of the built fabric of Venice, made in red or black pencil, or metalpoint. Many are worked over in brown or black ink. Fig.2 reproduces a sample page showing buildings lining one side of the Campo Santa Maria Formosa, one of the city's smaller squares.³ There are notes with the names of shops – *Spicier d. Ma* (the apothecary of Maria, at bottom left) – and the colours of walls – *zalo* (yellow), *B* for *Bianco* (white). If one goes to the square today one finds that Maria's apothecary is still in business as a modern pharmacy. Other pages have notes on building materials and on the numbers of windows, arches, or columns in rows.

When the sketches are matched to the paintings it turns out that there are between four and ten sketches per painting, plus one panorama of the Bay of San Marco, the Bacino, made up of 12 pages. Of the groups of sketches, 13 are for paintings sold to the Duke of Bedford in the mid-1730s (now at Woburn Abbey), showing that the *quaderno* itself dates from that decade.⁴ Each group of sketches covers a subject in parts, running in sequence, one part to a page of the book, with each drawing in general matching edgewise with the next in sequence, which may be on the opposite side of a double spread or over the page. The sketches are not only preparatory for paintings. Canaletto uses some as the basis of larger finished drawings for sale.

Fig.3 shows four successive pages (two spreads) from the *quaderno* covering the classical church of San Simeone Piccolo and *palazzi* and houses on either side of the church, seen from the opposite bank of the Grand Canal.⁵ Canaletto must have made these sketches around 1738 when the church was just being completed. He drew blocks of unused stone, and a makeshift flight of steps made of planks, with temporary wooden handrails. He produced two slightly different finished drawings from these sketches. (There is no painting.) Close analysis shows that Canaletto worked from two viewpoints, not far apart. Fig.4 superimposes the sketches over two photographs taken from these positions by Gregorio Astengo.

Fig.1 Antonio Canaletto, a *scaraboto* ('scribble') from his Venice sketchbook, the *Quaderno*, page 6 *recto*, showing Jacopo Sansovino's Marciana Library and the two freestanding columns in the Piazzetta. Pencil, 17 x 23 cm. While there are no dates inscribed in the book, it is clear it is from the 1730s. This and all other pages from the *Quaderno* are reproduced with the kind permission of the Gallerie dell' Accademia, Venice.

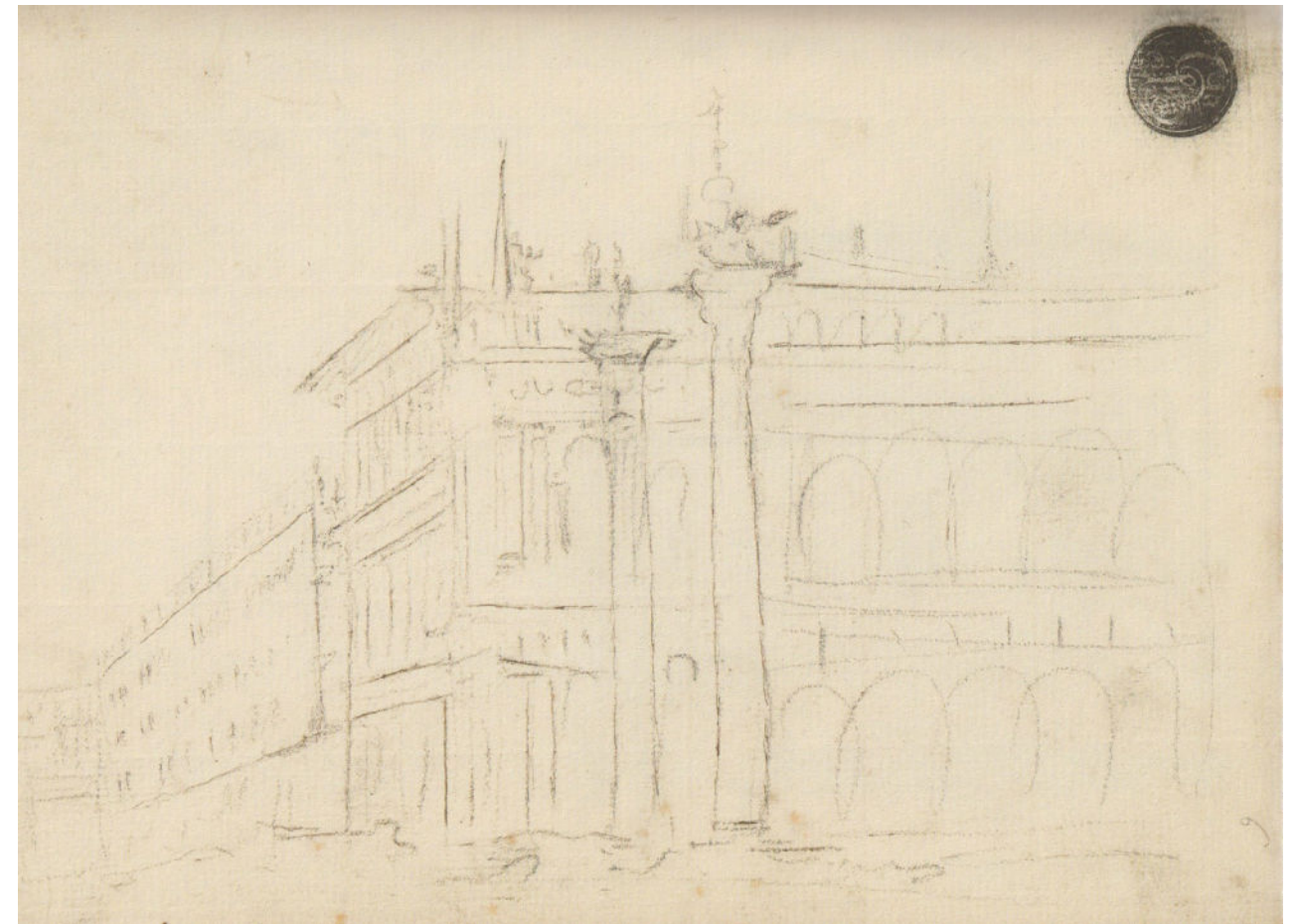


Fig.2 *Quaderno* 39 recto; buildings on one side of the Campo Santa Maria Formosa. Red crayon and ink, 23 x 17 cm.



The view has hardly changed in the intervening three centuries, except for a few minor alterations to the houses. The comparison shows how faithful Canaletto is to the dimensions and details of the architecture.

The camera obscura

Canaletto made the *quaderno* sketches with a camera obscura. We can be confident about this, for several reasons. First, his contemporaries said that he was practised in the use of the instrument. Anton Maria Zanetti the Younger was a historian who included an entry on Canaletto in his book *On Venetian Painting*, published soon after the painter's death.⁶ Zanetti is a reliable witness. He knew Canaletto and talks about 'my memories of this excellent Master':

Canal taught the proper use of the *camera ottica* and showed what defects can be introduced into a painting when its whole perspective arrangement is taken from what can be seen in the camera, particularly the colours of the atmosphere, and when one does not eliminate things offensive to the senses. The Professor will understand me.⁷

A French collector and dealer in drawings and prints, Pierre-Jean Mariette, wrote another brief life echoing Zanetti, saying that Canaletto 'made use of the camera obscura, of which he knew how to moderate the faults'.⁸ Antonio Conti, a priest turned scientist from Padua who knew Canaletto's lifelong patron Joseph Smith, wrote about how the artist used the camera 'to make the perspective of a canal in Venice with its buildings'.⁹ Francesco Algarotti, another associate of Smith and a friend of the artist, wrote a popular book about Newton's optics in which he compares the luminous coloured image on the camera screen to a 'vista by Canaletto'.¹⁰

The second form of evidence for the painter using the camera is the great fidelity of the sketches to the buildings of Venice. We have seen this accuracy in the drawings of San Simeone. Following the economic decline of Venice in the 18th century and the fall of the Republic to the French in 1797, change in the city largely ceased. It is thus still possible for the most part to compare the sketches against their subjects. In 1959 Decio Gioseffi published the only book to date on Canaletto and the camera obscura.¹¹ Gioseffi used a special viewing device to compare sketches with photographs.¹² Gregorio Astengo and I have been following Gioseffi's lead. Astengo has photographed most of the scenes covered by the *quaderno*, and we have been superimposing the sketches using Photoshop and other digital tools.

There are occasional discrepancies, and of course some buildings have been altered or replaced. But in general, the matches are as accurate as those illustrated for San Simeone. For example, four pages of the *quaderno* are devoted to the gates of the Arsenal, where ships were built for the Venetian navy.¹³

Fig.5 shows three of these superimposed over a photo taken from Canaletto's viewpoint. The chapel in the form of a Greek temple at the right has gone, and the wooden bridge has been reconstructed and repositioned, but otherwise the correspondence is close.

The third reason for believing that the camera was used is to be found in certain revealing idiosyncrasies of the sketches themselves. It is clear that they were executed quickly, only rarely with any shading. The images are flattened and lack depth – lines can run continuously around many overlapping buildings and roofs, even though these are at very different distances. The lines are grasped immediately without hesitation, and there are few corrections or second thoughts. Terisio Pignatti, who published the first facsimile and analysis of the *quaderno*, remarks on his first impression of the 'instrumental monotony' of the book.¹⁴

Most of the sketches have no ticks or dots to set out the regular spacing of openings, although there are a few places where Canaletto uses guidelines to straighten up columns or to position rows of windows, some of which are ruled. The elliptical curves of domes are drawn smoothly without kinks. Sometimes the rooflines of long buildings dip very slightly towards the middle, as they can do in reality because of the ridge beams sagging, an effect hardly noticeable to the naked eye. There are a few places where the sketches are rough and seemingly hurried, but comparison with the subjects shows that they are nevertheless broadly true to the proportions and dimensions of the architecture.

All this is suggestive, but not definitive proof of a camera being used. Such characteristics could be the product of careful observation and extreme skill in making freehand sketches by eye. There are further features, however, that are much more difficult to explain, other than by reference to the camera. They have to do with the placing of images on the page.

The entire page of the *quaderno* is generally filled to the edges. Buildings can run off the page at the sides and the top, and important monuments like churches are often cut off arbitrarily. This phenomenon would result from the standard-size page of the sketchbook being placed under the projected image and catching just what fell on to the sheet. By contrast, a draughtsman working by eye would surely judge the overall size of a subject first and would want to make sure that all of it fitted on to his paper.

Unless they are very far away, tall structures such as belltowers and the domes of churches can go off the top of the sheet – in which case the missing upper parts are drawn separately in the empty sky of the view. This could have been done by sliding the sketchbook up the drawing table, since the image would extend beyond the area of the page. The sketches of San Simeone Piccolo provide an example. Fig.6 reproduces two pages of the *quaderno* on the front and back of one sheet.¹⁵ On the first page Canaletto draws two thirds of the church's great dome but does not have space for the columned lantern on top, so he moves the book to record the cupola at the left of the page.

Fig.3 Quaderno 52 verso, 53 recto and verso, 54 recto; the church of San Simeone Piccolo and adjoining buildings on the Grand Canal. Pencil and ink, each page 23 x 17 cm.

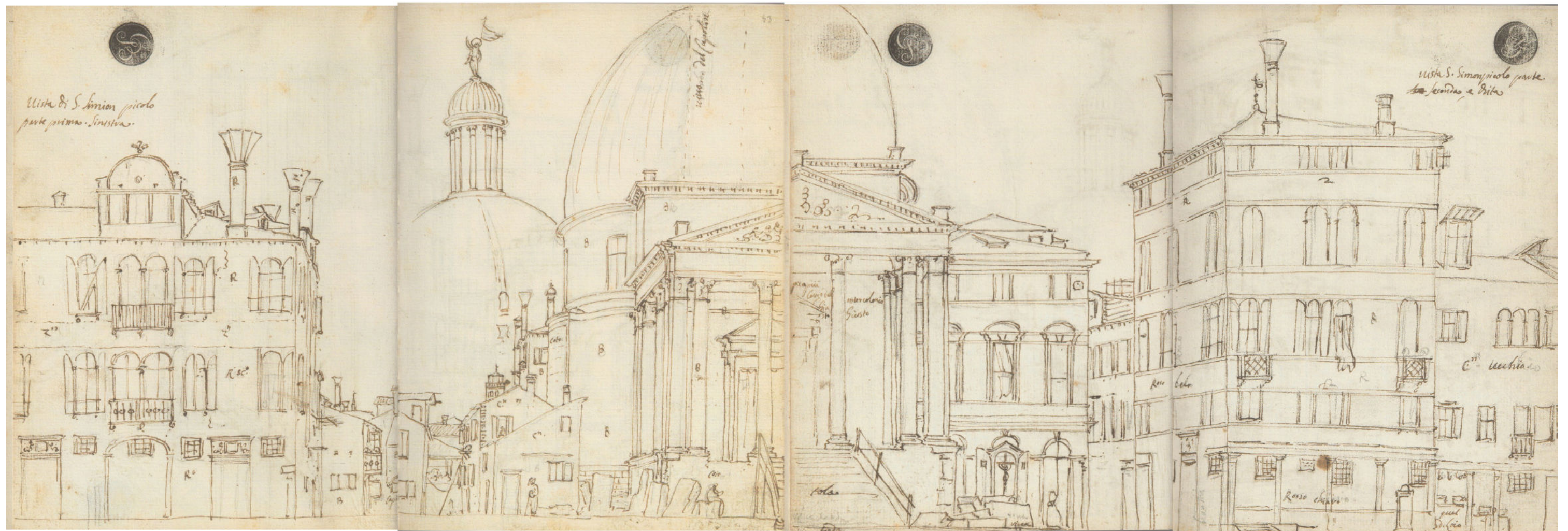


Fig.4 The sketches of Fig.3, retraced for clarity, superimposed on two joined photographs by Gregorio Astengo.



Fig.5 The gates of the Arsenale, retraced for clarity from *Quaderno 34 verso*, *35 recto*, and *36 recto* and superimposed over a photograph by Gregorio Astengo.

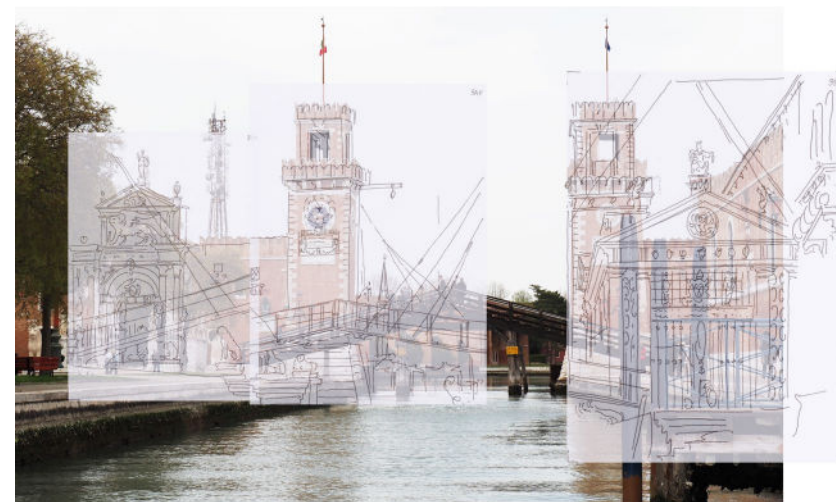


Fig.6 Quaderno 53 recto and verso. Pencil and ink, each page 23 x 17 cm; showing how the church of San Simeone Piccolo is drawn in parts on the front and back of one sheet.

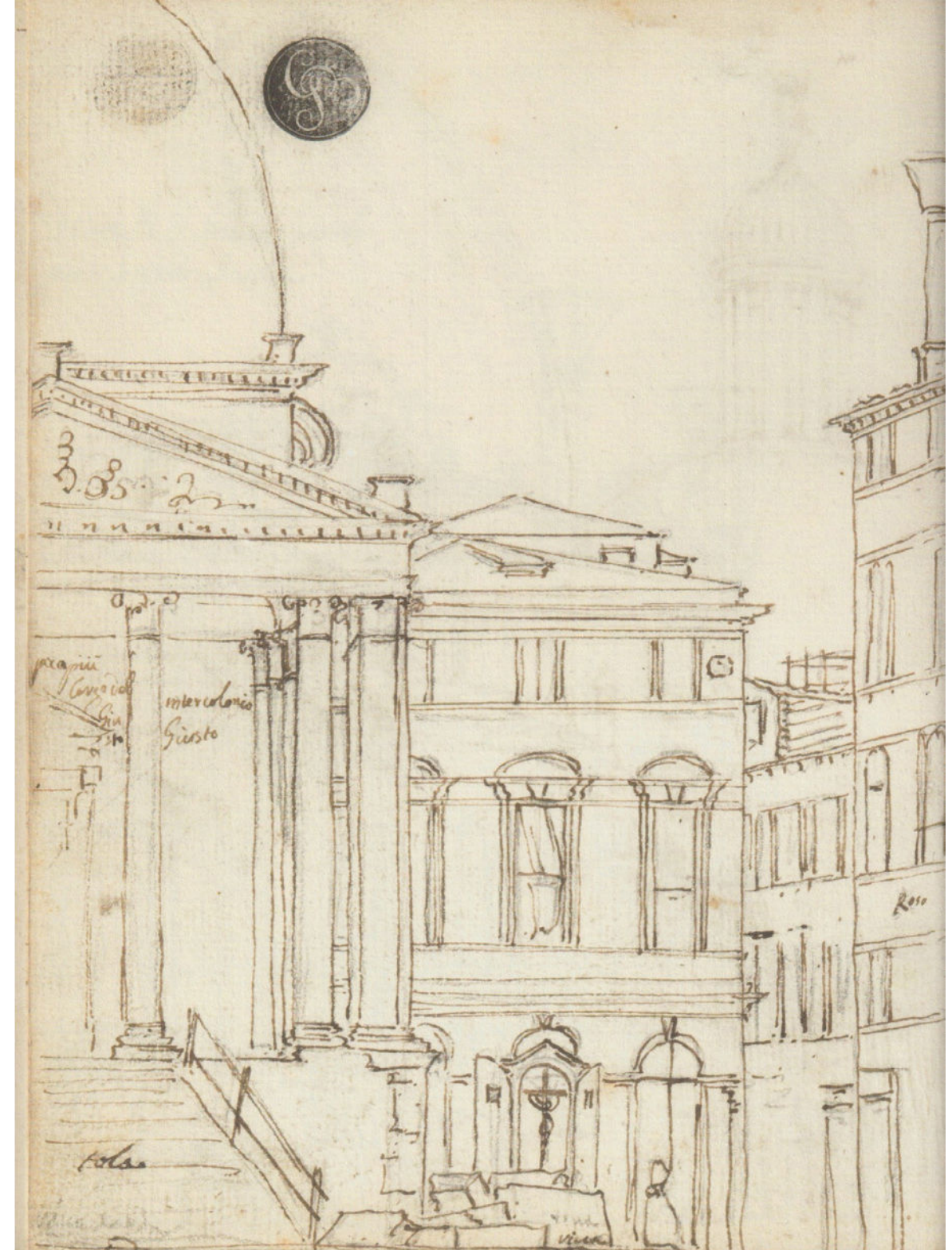
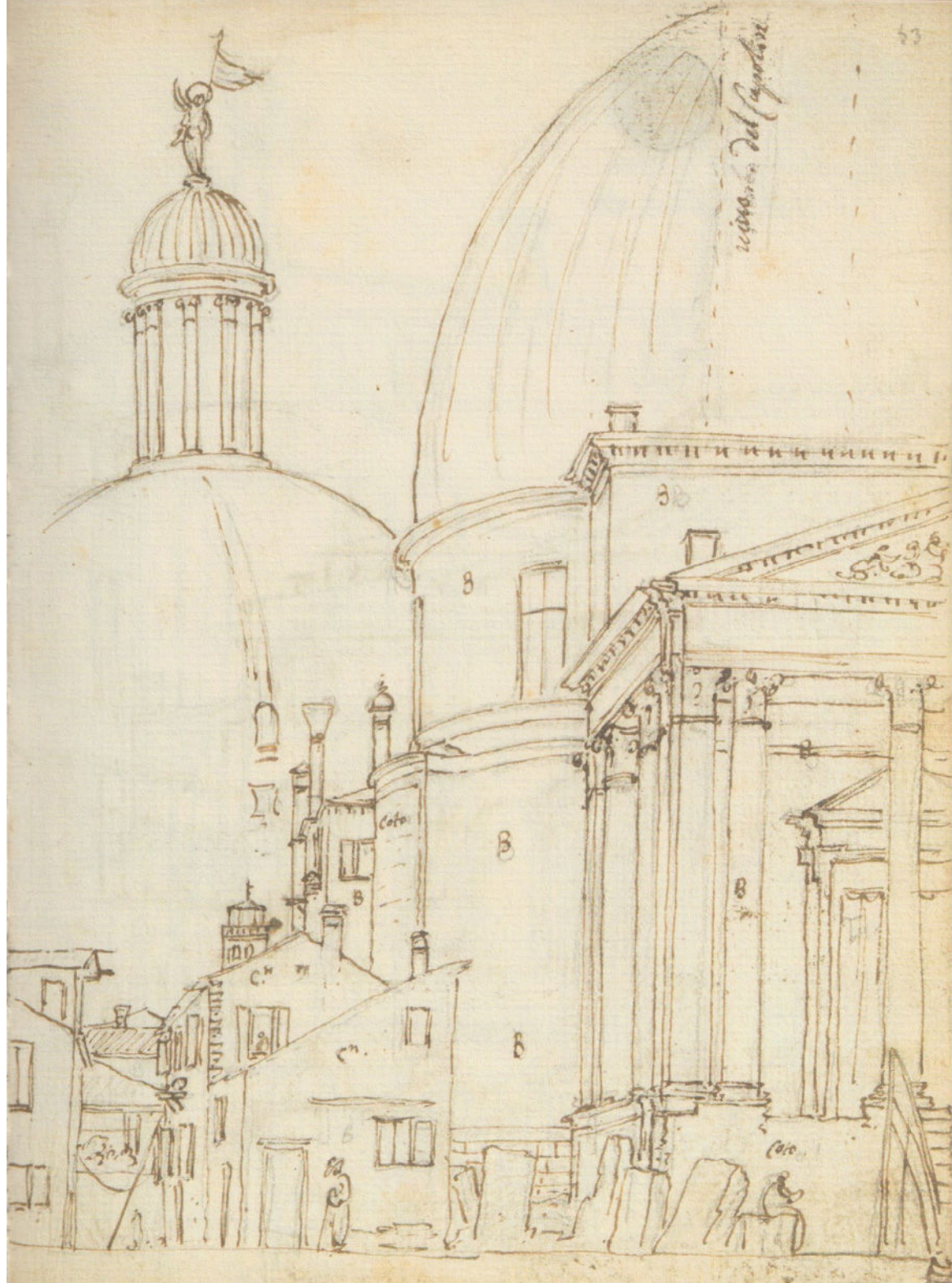


Fig.7 Box-type camera obscura in the Correr Museum in Venice stamped on the top with the name 'A CANAL'. Photograph by Gregorio Astengo.



Fig.8 Optical image of the Campanile in the Piazza on the screen of the 'A CANAL' box camera (left), compared with a photograph of the view direct (right). The image in the camera obscura is mirrored. Photographs by Gregorio Astengo.



He draws two dotted vertical lines on the main dome to show where the lantern should be aligned. The remaining third of the main dome is traced on the next page, on the back of the sheet. This would be a very odd procedure for an artist sketching by eye, but is again explained by the exigencies of a camera method.

Another suggestive trait: Canaletto omits certain features of buildings that it is possible to see directly, but which could have been difficult to make out in an optical image. These include dark glazing bars against the blackness of window glass, which he often renders cursorily with rough criss-cross lines, and the ribs on the domes of churches.

The type of camera

By the 18th century several types of camera obscura were described in print and were available for sale.¹⁶ It was possible to turn an entire room into a camera obscura – as in the original meaning of the term – by blacking it out, putting a lens in a hole in a window shutter, and setting up a screen opposite the lens. Smaller freestanding cameras could take the form of closed booths, cubicles, or tents in which artists worked on drawing tables, and which were reasonably portable. Or cameras could be made in the form of yet smaller closed boxes with ground-glass screens on the outside, like 19th-century photographic plate cameras.

In 1901 there was a dramatic development in the story of Canaletto and the camera: Luigi Vason donated a box-type instrument to the Correr Museum in Venice, with the name 'A. CANAL' stamped on its case (Fig.7). (The painter was christened Antonio Canal – he acquired the diminutive later.) The tube at the front of the box contains the lens and can be moved in and out to adjust the focus. There is a mirror inside, set at 45°, that reflects the optical image up on to the ground-glass screen on top. Above this, there is a wooden hood that shields the image from ambient light and makes it easier to see. To draw, one must place transparent paper over the screen and trace the image that appears upon it. Gregorio Astengo examined the instrument in 2022 and pointed it out of a window of the Correr at the Campanile in Piazza San Marco.¹⁷ Fig.8 shows the image on the camera screen, set alongside a photograph of the Campanile taken directly. The image in the camera obscura is reversed left to right.

On the face of it, this rediscovery of what is apparently the painter's actual camera would seem conclusive. Over recent decades, however, doubts have emerged. Questions have been raised about the authenticity of the inscription, and there has even been a rumour – to my mind quite implausible – that the instrument is a fake. However this may be, there are two reasons why the sketches in the *quaderno* could not have been made with a camera of this type. First, with a box camera the image is projected upwards, and one must draw on tracing paper, while the sheets of the *quaderno* are opaque and have sketches on both sides. Secondly, the image in a box

camera is flipped horizontally and the drawings in the *quaderno* are not. The 'A. CANAL' camera has proved an unfortunate distraction to Canaletto scholars. It may well be authentic and may have belonged to the painter, but he could only have used it for observing views and perhaps judging questions of framing and composition.

By contrast, in a booth or tent camera the image can be projected downwards from above on to a drawing table. There is a mirror set at 45° on top of the instrument that reflects the scene down on to the lens, which is in a vertical tube. The artist faces in the opposite direction from the view. This means that the image on the table is the right way up and is not mirrored left to right. Fig.9 reproduces one of a series of etched views of scenes along the Brenta canal by a contemporary of Canaletto, Giovanni Francesco Costa.¹⁸ The enlarged detail shows an artist – perhaps Costa himself – making a drawing with a tent camera on legs. The view is reflected in a tilted mirror on top of the camera and is projected down on to the drawing surface. We can see that the user has his back to the scene. An assistant holds an umbrella over them. This is not to keep them dry or cool, but is to stop light from the sky spilling down the lens tube and weakening the image.

I believe Canaletto must have used a similar instrument, either a tent like Costa's or a more substantial cubicle in which he was completely enclosed. In cameras of these kinds the image seen in the darkness seems, once the eyes have adjusted to the low level of light, to be subjectively much brighter than images formed with box cameras. There were several instrument-makers selling camera obscuras for draughtsmen in Venice in the 18th century, including the renowned workshop of Domenico Selva and sons.¹⁹ It is possible to link Canaletto indirectly to the Selvas via Algarotti and others of Joseph Smith's scientific acquaintance.²⁰

My colleague Adam Azmy has built a reconstruction of an early 18th-century design of a tent camera, illustrated in a book on perspective by the Dutch mathematician W.J. 's Gravesande.²¹ Algarotti knew 's Gravesande's work, and there is a copy of the first edition of his book in the library of the Correr Museum. I have been using this instrument to make sketches comparable, at least technically, with those in the *quaderno*. There are no great difficulties. This work is to be reported in detail elsewhere. Fig.10 shows an image on the screen of our camera of the front quadrangle of University College London, my place of work. The instrument has a single lens with no special refinements or coatings, of no higher quality than those that would have been available to Canaletto. The brightness, sharpness and clarity of the image are typical of larger camera obscuras generally. Fig.11 reproduces two pages of my sketches of UCL's Wilkins Building, each of which took about 20 minutes to trace. Working fast, I was able to capture some of the many students sitting or standing still in the quad.

Fig.9 Giovanni Francesco Costa, etching of a view on the Brenta canal, 26 x 34 cm; from *Delle Delizie del Fiume Brenta*, published by the author (Venice, 1750–62). The enlarged detail shows an artist using a tent-type camera obscura.

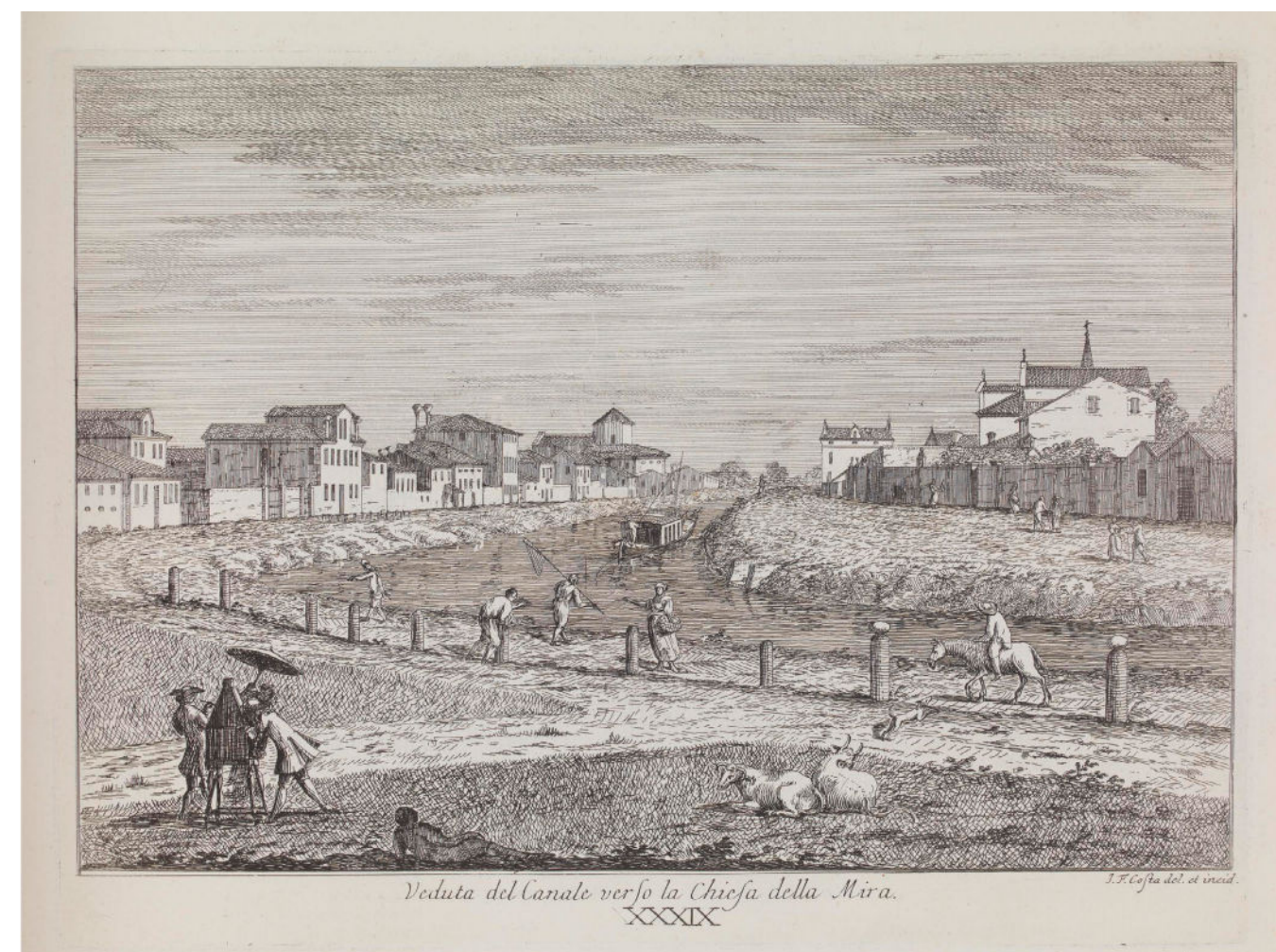
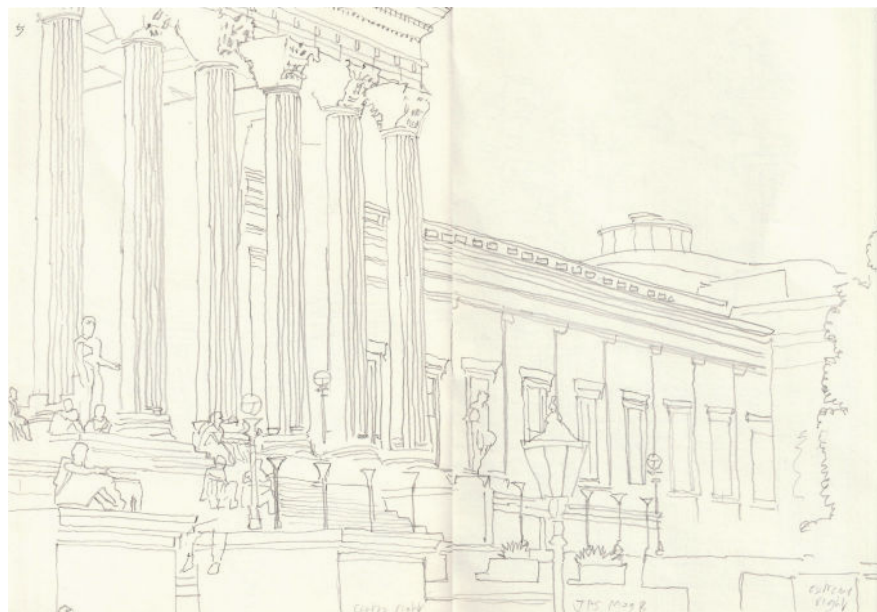
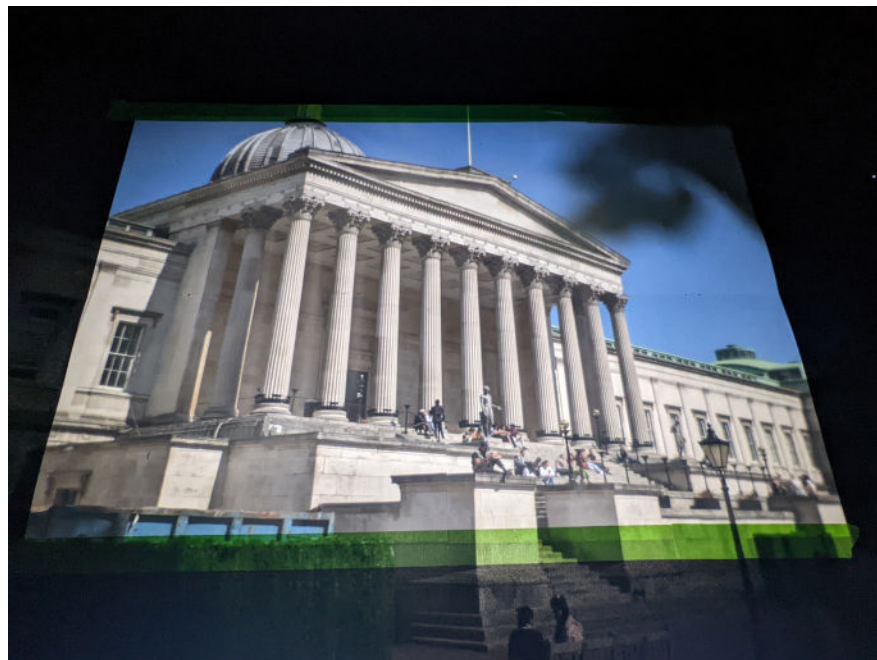


Fig.10 Projected optical image of the front quadrangle of University College London on the drawing table of an eighteenth-century design of tent camera, reconstructed by Adam Azmy.

Fig.11 Two pages of sketches of the Wilkins Building at UCL drawn by the author in Azmy's reconstructed eighteenth-century tent camera.



In summary, then, Canaletto used a booth or tent camera like Costa's to make the sketches in the *quaderno*. Experiments with our reconstructed camera show that this is perfectly feasible. If the 'A. CANAL' instrument is authentic – and the inscription certainly encourages that idea – then Canaletto could only have used it for studying optical images, not for the *quaderno* tracings. The quality of images in 18th-century cameras was excellent, and concerns expressed by some historians about optical distortions and problems of focus have been exaggerated.

The church of SS Giovanni e Paolo

I will now make a close examination of a scene for which there are four pages of sketches (two spreads) in the *quaderno*. This is the church of SS Giovanni e Paolo and the adjoining Campo. Fig.12 shows the painting in question. We are facing the west front of the church. To test the accuracy of the *quaderno* sketches we overlaid them on photographs. Now, by superimposing the sketches on a painting, we can see both where Canaletto follows the sketches, and where he decides to depart from real appearances. In this particular case there are several differences between sketches and painting, of kinds that are found in the artist's work more generally.

In the centre of the picture of Fig.12 is the equestrian monument to Bartolomeo Colleoni,

Captain General of the Venetian Republic, sculpted by Andrea del Verrocchio. At the extreme left, seen obliquely, is the Scuola Grande di San Marco, a building erected for one of the city's medieval confraternities. In the foreground is a small canal, the Rio dei Mendicanti. There have been some changes to the architecture of the church since the 18th century, including replacement of the 17th-century semi-circular windows with round windows, and the addition of a belltower. The painting was acquired by Joseph Smith, who sold it in 1763/64 to King George III of the United Kingdom. It remains in the Royal Collection today.

Decio Gioseffi compared the painting with a photograph that he took from a position on the opposite side of the canal, where a narrow alley – the Calle del Forno – opens on to the water.²² Fig.13 shows a plan of the Campo and the church, with this viewpoint marked '1'. The match of Gioseffi's photo to the right-hand half of the painting was close (Fig.14). Fig.15 shows a wider-angle photo from this position in the Calle del Forno. What is immediately clear is that the west front of the church is not painted from the same viewpoint as the open space of the Campo – the façade is seen frontally in Canaletto's picture and does not recede at an oblique angle. Canaletto has also made the dome of the church taller than it really is.

The four pages of sketches are on sheet 50 *verso*, sheet 51 *recto* and *verso*, and sheet 52 *recto*.

Fig.12 Antonio Canaletto, *Campo Santi Giovanni e Paolo*, 1735–38. Oil on canvas, 46 x 78 cm. Royal Collection Trust / © His Majesty King Charles III 2023.

Fig.13 Plan of the Campo SS Giovanni e Paolo showing the church, the Scuola Grande di San Marco, and the Rio dei Mendicanti. A first viewpoint 1 is indicated at the opening onto the canal of the Calle del Forno. A second viewpoint 2 is indicated on the Ponte del Cavallo. The base of this plan is from Ludovico Ughi's map of Venice of 1729.

Fig.14 Photograph by Decio Gioseffi from viewpoint 1 in the plan of Fig.13, of the right-hand half of the scene of Canaletto's painting. From Gioseffi, *Canaletto: Il Quaderno delle Gallerie Veneziane* (Università degli Studi di Trieste, 1959), 43 Fig.36.

Fig.15 Photograph by Gregorio Astengo from viewpoint 1 of the whole of the scene of Canaletto's painting.

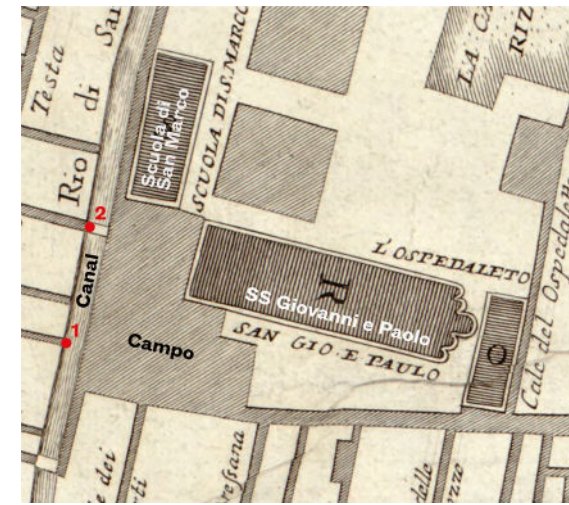
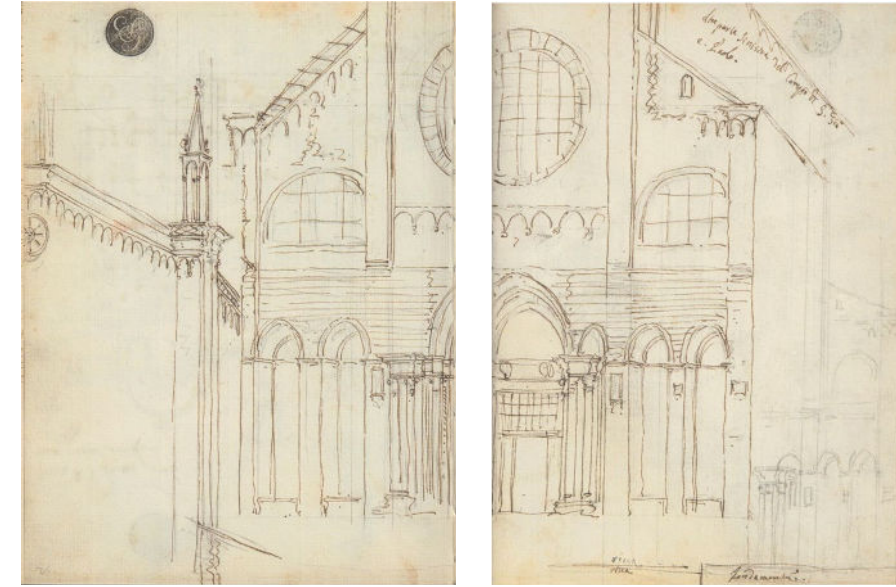


Fig.16 *Quaderno 51 recto* (left) and *50 verso* (right, making a spread). Pencil and ink, each page 23 x 17 cm; and tracings superimposed on the right-hand half of Canaletto's painting. Notice on *50 verso* the broken line joining the top of the church transept to the chimney on the house at the right.



Fig.17 *Quaderno 52 recto* (left) and *51 verso* (right, making a spread). Pencil and ink, each page 23 x 17 cm; and tracings superimposed on the left-hand half of Canaletto's painting. Notice that one half of the top of the nave of the church is drawn at the left, since the building is too tall to fit on the page. The Scuola di San Marco, which should be on *52 recto*, is missing. On *51 verso*, at bottom right, at a reduced scale and in pencil, there is a 'double exposure' of the aisle of the church.



In order that the sketches are readable in the digital superimpositions we have retraced them carefully in ink. The right half of the painting is covered by the double spread of pages 50v and 51r (Fig.16). Canaletto's raising and enlargement of the dome in the painting can be clearly seen.

He has also made changes to the row of buildings seen in steep perspective that line the Campo at the right. These are traced accurately, but Canaletto then alters the sizes and positions of houses for the painting. The house at the extreme right is shifted rightwards. Other more distant houses are made taller. Canaletto signals his intention to do this on page 50v by drawing a broken line across the sky from the roof of the transept to a trumpet-shaped chimney on a house at the right. He uses this convention a number of times in the *quaderno* to indicate that he intends features of roofscapes to be depicted on the same level, sometimes adding the note '*alto come questo*' ('as tall as this'). His purpose in changing the buildings in this case may perhaps have been to close the composition more decisively at the right.

I am not completely decided as to whether Canaletto has altered the size and position of the Colleoni monument. If he has, it is only by a small amount, perhaps to give it an enhanced visual prominence. (The way he has lit the plinth also makes it stand out against its background.) The statue seems not to be in exactly the same position in our photograph and in the painting (compare Fig.15), but this may be because the photographic viewpoint is at a slightly different height from Canaletto's – his seems to be closer to the level of the water. One suggestive feature of the camera tracing, however, is that Canaletto has ruled vertical pencil lines over the plinth, whose purpose might have been to help in re-drawing it in a different position. There are very few other ruled lines elsewhere on this spread.

Turning now to the left half of the picture with the west front of the church and the Scuola di San Marco, we find that these are traced with the camera on the two pages 51v and 52r, which together form a second spread in the *quaderno* (Fig.17). The sketches have several odd features. First, the upper part of the nave is drawn separately on the left of page 52r. This is a regular feature of the *quaderno* where buildings go off the top of the sheet, as we have seen. Canaletto also draws only one half of the top of the nave. This is another frequent gambit. Where the façade of a symmetrical building is seen frontally, he draws just half, always the right half. He presumably has some way of mirroring the drawing to produce the matching half, back in the studio.

A further oddity is that the Scuola di San Marco does not appear where it should on page 52r. The exact profile of the right-hand edge of the building is traced where it meets the church, but that is all. The Scuola's rightful place is taken by the top of the nave. This is yet another recurrent feature of the *quaderno* sketches. Canaletto can work his way along a series

of anonymous buildings facing, say, on to the Grand Canal, but when he reaches some architecturally significant *palazzo*, he leaves a blank space. I interpret this to mean that he is not going to rely on a camera sketch for the building but will take his view from some other existing image, perhaps a measured drawing by the architect or an engraving by another artist.

One striking fact about Canaletto's surviving Venetian camera sketches is that the vast majority cover the anonymous everyday fabric of the city and not its monuments. The only remaining camera sketches for buildings around the Piazza San Marco are for the Campo San Basso, off the Basilica, the one section lined with small houses and shops. It is of course perfectly possible that Canaletto and his studio made camera drawings of *palazzi*, churches and other great buildings, and that these have been lost, perhaps worn out by repeated use. But there could be another explanation.

Canaletto scholars have suggested that the artist might have made use of the many engravings of *palazzi* and churches published by the older topographic painter Luca Carlevarijs (1663–1730) in his *Buildings and Views of Venice* of 1703.²³ In his book *Canaletto: Una Venezia Immaginaria* (1985), the urban historian André Corboz discusses possible 'graphical sources' at length, including Carlevarijs and the engraver Domenico Lovisa.²⁴ While Canaletto certainly uses Carlevarijs as a source of compositional ideas, comparisons with the real buildings show Carlevarijs's drawings to be quite unreliable in detail.²⁵ He systematically makes buildings narrower in relation to their height than they really are, and there are also inaccuracies in spacing and fenestration. Gregorio Astengo and I have new ideas about Canaletto's sources of measured drawings, which will be the subject of a future publication.

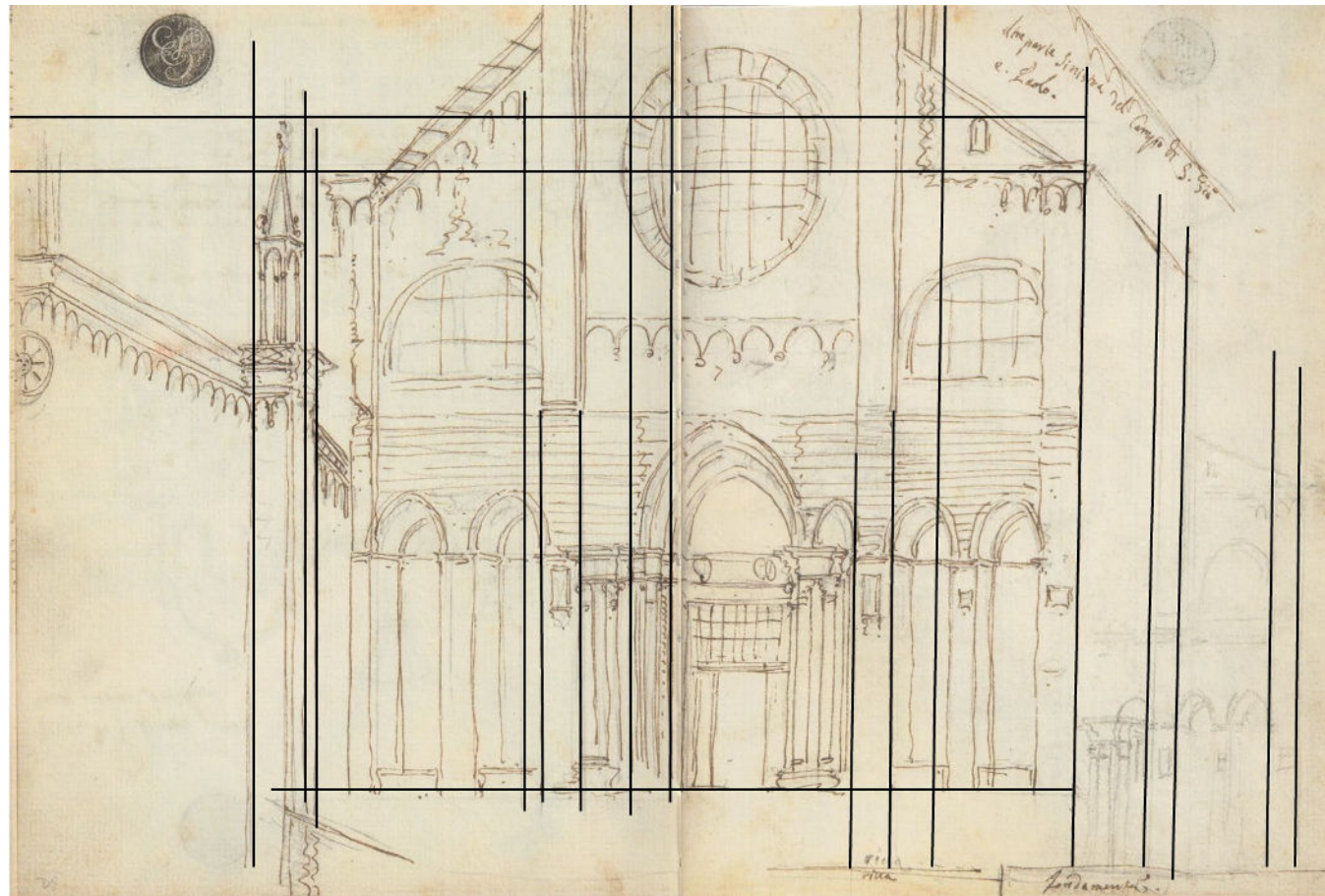
Returning to the sketches on the spread illustrated in Fig.17, their strangest property is in their perspective geometry. The façade as a whole is seen frontally – it does not recede at an angle to the left, as in the photograph (compare Fig.15). One might immediately think that Canaletto has made these sketches from a different position, directly opposite the façade. Astengo has taken a second photograph to test this idea, from a bridge across the canal, the Ponte del Cavallo (see the plan in Fig.13, where this second viewpoint is marked '2'). Fig.18 is a composite of our two photographs, joined at the corner of the church. (Like Canaletto, we had difficulty getting the top of the nave into view from this standpoint without pointing the camera upwards.) While there is a broad resemblance to Canaletto's picture, the proportions of the west front are quite different – it is much wider in relation to its height, compared with what the painting shows.

And there is another perplexing oddity. In the photo of the façade the entrance door and the blind arches at either side are seen frontally. But in the *quaderno* sketches these are all drawn obliquely,

Fig.18 A composite of two photographs by Gregorio Astengo from viewpoints 1 and 2 in the plan of Fig.13, approximating the whole of Canaletto's painting. The join is at the corner of the church.



Fig.19 Canaletto rules a framework in pencil on the *Quaderno* sketches 52 *recto* and 51 *verso* of the west front of SS Giovanni e Paolo. Here the pencil lines are emphasised.



not from directly in front. We see more of the reveal of each arch at the left than at the right. It is as though the outline of the west front is viewed from one angle, and its architectural detail from another.

I have come to the conclusion that in this left half of the painting Canaletto does something quite unusual compared with his standard practice. He seems to be producing a sketch that is partly made with the camera and partly by geometrical construction. He has drawn the façade with the same width as it has in an oblique view taken from the first viewpoint at the Calle del Forno. He has ruled a framework of pencil lines to guide him as he converts the oblique view projected in the camera, working by eye, into a rectangular frontal view. I have illustrated this pencilled framework in Fig.19 by reinforcing the lines. Part of the right-hand side of the façade is repeated in a small pencil sketch at the bottom of page 51v (Fig.17). This is what Gioseffi would call a 'double exposure'.²⁶ Could Canaletto be making a graphic trial here of what he intends to do to the complete façade?

Manipulations of reality

What are the purposes of these various manipulations? The changes that we see in SS Giovanni e Paolo are typical of many of the view paintings. Why does Canaletto depart from the faithful transcriptions of the camera sketches? One can only speculate, but the changes presumably serve a series of compositional purposes. When he raises and enlarges the domes of churches, which he does repeatedly, this must be to give these buildings the visual prominence they deserve. In his views of the Piazza from the west he greatly magnifies the Basilica of San Marco to make it larger in both height and width.

A psychological issue, of which photographers are aware, is the tendency of people to imagine that tall buildings, or hills, are taller than they appear in correct perspective pictures. This is why, when people take snapshots of landscapes, they are often disappointed by how minuscule the grandest mountains look. I once assisted at the making of a television programme where an artist was asked first to make an accurate drawing by eye of a view of Delft in Holland, and then to trace the same view in a camera obscura. Working by eye, he had considerably exaggerated the heights of the church spires. Canaletto is evidently aiming to meet his viewers' mental expectations in this respect, and not disappoint them.

Then there is Canaletto's habit of turning façades seen at angles to face frontally, as with the west front of SS Giovanni e Paolo. He does this elsewhere with the Doge's Palace, the front of the Palazzo Balbi on the Grand Canal, and the return walls of several other *palazzi*. The purpose, I suggest, is to stop the viewer's eye being led out towards the edges of the picture, and to keep the focus on the central space of the composition. Canaletto started his career as a scene painter. The typical 17th- and early 18th-century Italian stage set had a central piazza or street, lined

on either side by 'houses' that always faced front. Maybe Canaletto was following his original theatrical training here.

A further gambit, not seen in this picture, is to quietly move the Campanile or other towers and spires sideways, behind the rooflines of nearer buildings. In this way Canaletto can place vertical emphases in the most visually appropriate places.

Finally, there is the question of multiple viewpoints in one picture. The painting of SS Giovanni e Paolo is, in some sense, a composite of two views from different positions, as we have seen. This is yet another recurrent characteristic of Canaletto's procedures. Among the many paintings that Astengo and I have analysed, there are a few that have single viewpoints. But more often Canaletto works from two or more positions. He has the skills in perspective to mask the 'joins' or make these in discreet places so that they are not noticed. For example, in his Grand Canal pictures the viewpoint for buildings on one bank is often different from the viewpoint of the opposite bank, as several Canaletto scholars have noted.²⁷ The join is made in the distance where the two sides meet. By this means he can paint panoramas without the obtrusive perspective distortions that can arise with the use of single wide-angle views.

As we have already noted, Anton Maria Zanetti the Younger said that Canaletto was able to avoid the defects in perspective associated with using the camera obscura. I suggest that the manipulations made by Canaletto to the camera sketches of SS Giovanni e Paolo show what Zanetti was talking about.

Canaletto in a tradition of view painting with the camera

Canaletto was the greatest European painter of urban scenes. He was not, however, alone in using the camera obscura. He can be positioned in a tradition of *vedutisti* that arguably has its origins in Holland in the 17th century. Johannes Vermeer (1632-1675) would not usually be described as a view painter, but his *View of Delft* marks a high point in the history of European topographical art. Kenneth Clark described the picture as 'the nearest ... painting has ever come to a coloured photograph'.²⁸ Tim Jenison has proved recently, by an analysis of the precise positions of the buildings and the angles at which they are seen, that the *View* was made with a camera.²⁹

The drawings of the Amsterdam painter Jan van der Heyden (1637-1712) have some of the characteristics of camera tracings that we have seen in Canaletto. He too traces just one half of a symmetrical feature, repeats selected details (Gioseffi's 'double exposures'), and adds notes on colours.³⁰ Sir Joshua Reynolds went to Holland and saw Van der Heyden's pictures, commenting that they had 'very much the effect of nature, seen in a camera obscura'.³¹ Reynolds was in a position to know, since he owned at least two cameras himself.

Fig.20 Francesco Guardi, *Campo of the Church Giovanni and Paolo with the Scuola di San Marco, Venice*, c.1760. Oil on canvas, 72 x 120 cm. Photo © RMN-Grand Palais (Musée du Louvre) / Stéphane Maréchal. Compare the photograph of Fig.15.



It was Gaspard van Wittel (1653–1736) who brought this tradition from Holland to Italy, where he pioneered the painting of topographical views as an Italian genre. In time Van Wittel turned from a Dutchman into an Italian, becoming Vanvitelli. Many of his camera sketches are now in the National Library in Rome. Again, there are affinities with Canaletto's *quaderno* drawings. It is at least possible that Canaletto met Vanvitelli in Rome in 1719 or 1720, although there is no documentary evidence for this.

Canaletto's nephew Bernardo Bellotto (1722–1780) began work in his uncle's studio and quickly became much more than an assistant. It was Bellotto who took camera painting back to Northern Europe, having great success in the 1740s and 1750s in the royal courts of Dresden, Vienna, Munich and Warsaw. Bellotto made paintings and drawings from Canaletto's Venetian camera sketches and adapted his uncle's technical methods to develop a distinctive darker style of his own. Two more painters who were also close to Canaletto at the beginning and end of his career were Michele Marieschi (1710–1743) in the 1730s and Francesco Guardi (1712–1793) in the 1760s. Both may well have worked with or for him. They repeated many of Canaletto's subjects, and both made paintings of the same view of SS Giovanni e Paolo that we have been examining.

A hint that Marieschi used the camera obscura is provided in a caricature of the artist by Anton Maria Zanetti the Elder, the cousin of his namesake. This shows Marieschi standing in front of a box camera set on a pedestal, pointed at a rather schematic urban scene with towers.³² Marieschi's version of SS Giovanni e Paolo copies Canaletto's painting exactly. He must have worked from the very picture or possibly from a working drawing that has not survived.³³

Pietro Gradenigo, a Venetian Senator, wrote explicitly about Guardi using the camera in an entry in his diary in 1764:

Francesco Guardi, a painter working in the SS. Apostoli quarter on the Fondamente Nuove, is a good pupil of the famous Canaletto, and has been very successful in painting, with the help of the optic camera, two big canvases ordered by an Englishman of the view of Piazza S. Marco looking towards the church and the Clock, and of the Rialto bridge and the buildings towards Cannaregio.³⁴

Fig.20 shows Guardi's painting of SS Giovanni e Paolo made around 1760. It differs markedly from Canaletto's. The picture does not have two viewpoints, and matches the single view from the Calle del Forno in every detail, as we can see from the photograph of Fig.15. Unlike Canaletto, Guardi has not enlarged the dome of the church, nor has he increased the height of any buildings towards the right. The Colleoni monument is less prominent than in the Canaletto and is seen in its true position. And the west front of the church is seen obliquely.

This is surprising because Guardi is often described as a loose, careless, 'impressionist' painter with an unreliable grasp of perspective.³⁵ Here Guardi must have taken his own camera to the Calle del Forno, transcribed the scene more faithfully than Canaletto, and made his painting direct from the sketches without major changes.

There is a general lesson here. Canaletto's style of painting in the works produced in quantity in the 1730s and early 1740s can be described as 'calligraphic'. Architectural detail is rendered with great precision in thin black or dark grey lines. This can be plausibly attributed to the transfer into paint of the camera sketches. Critics, starting with John Ruskin, have accused Canaletto of a dry, mechanical, 'photographic' manner.³⁶ This might be fair. But one should not assume that these are universal symptoms of optical methods. The fact that Vermeer, Vanvitelli, Bellotto and Guardi all use the camera obscura in support of their varied styles proves this idea to be misconceived.

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- 1 The sketchbook was first published in facsimile by Terisio Pignatti (*Il Quaderno di Disegni di Canaletto alle Gallerie di Venezia*, Venice: Daria Guarnati, 1958) with an introduction and a catalogue relating all the pages to Canaletto's paintings and finished drawings. Two more facsimiles have since been published: Giovanna Nepi Scirè, ed., *Canaletto's Sketchbook* (Venice: Canal & Stamperia, 1997), again with extensive notes in English; and Annalisa Perissa Torrini, ed., *Canaletto: Il Quaderno Veneziano* (Venice: Marsilio, 2012), as part of a catalogue of an exhibition held at the Palazzo Grimani in that year. The sheets of the book are numbered, and the pages referred to as *recto* (front) and *verso* (back), e.g. 52 *recto*, 52 *verso*.
- 2 *Quaderno*, *op. cit.*, 6r.
- 3 *Ibid.*, 39r.
- 4 Noted by W.G. Constable, *Canaletto – Giovanni Antonio Canal – 1697–1768*, vol.2 (Oxford: Clarendon Press, 1962: rev. edn, ed. J.G. Links, 1976), 572–74.
- 5 *Quaderno*, *op. cit.*, 52v, 53r, 53v, 54r.
- 6 Anton Maria Zanetti the Younger, *Della Pittura Veneziana e delle Opere Pubbliche de' Veneziani Maestri* (Venice: Giambattista Albrizzi, 1771), 462–63.
- 7 *Ibid.*, 463.

- 8 Pierre-Jean Mariette, *Abecedario sur Les Arts et Les Artistes*, vol.1 (Paris: J.-B. Dumoulin, 1851–53), 298. In the early 19th century the Venetian professor and historian Agostino Segredo wrote that ‘Canaletto was the first to use the *camera oscura* for reproducing views’, although Segredo might well have been repeating Zanetti and Mariette. See the entry on Canaletto in Emilia de Tipaldo, ed., *Biografia degli Italiani Illustri*, vol.1 (Venice: Alvisopoli, 1834), 351.
- 9 Antonio Conti, *Prose e Poesie*, vol.II (Venice: Pasquali, 1739), 250.
- 10 Francesco Algarotti, *Il Newtonianismo per le Dame, ovvero Dialoghi sopra le Luce e i Colori* (‘Naples’ [actually Venice], 1737), 80–81.
- 11 Decio Gioseffi, *Canaletto: Il Quaderno delle Gallerie Veneziane e l’Impiego della Camera Ottica*, no.9 (Università degli Studi di Trieste, Istituto di Storia Dell’Arte Antica e Moderna, 1959).
- 12 *Ibid.*, 42, figure in note 48.
- 13 *Quaderno, op. cit.*, 34v, 35r, 35v, 36r.
- 14 *Ibid.*, 12.
- 15 *Ibid.*, 53r, 53v.
- 16 For a general history of the camera obscura and its uses in art, see J.H. Hammond, *The Camera Obscura: A Chronicle* (Bristol: Adam Hilger, 1981). Also, ch. 1 of P. Steadman, *Vermeer’s Camera* (Oxford: Oxford University Press, 2001).
- 17 Gregorio Astengo and I are grateful for the kind permission and assistance of the Director of the Correr Museum, Andrea Bellieni.
- 18 Giovanni Francesco Costa, ‘Veduta del Canale verso la Chiesa della Mira’, in *Delle Delizie del Fiume Brenta* (Venice: published by the author, 1750–62).
- 19 See Alberto Lualdi, ‘Venetian makers of optical instruments of the 18th–19th centuries: Part 2, The Selva Family’, *Bulletin of the Scientific Instrument Society*, no.77 (2003), 10–13. According to Lualdi, Domenico was in Venice by 1696, and his son Lorenzo, aged nine, joined him in the business in 1725. Lorenzo Selva published a series of catalogues of the products of the workshop, including *Esposizione delle Comuni, e Nuove Spezie di Cannocchiali, Telescopj, Microscopj, ed Altri Istrumenti Diottrici, Catottrici, a Catadiottrici Perfezionati ed Inventati de Domenico Selva* (Venice: Giambattista Pasquali, 1761). This describes the camera obscuras offered by the firm.
- 20 Lorenzo Selva’s catalogue of 1761 was dedicated to Algarotti.
- 21 W.J. ’s Gravesande, *Essai de Perspective* (The Hague: Albert Troyel, 1711). Two designs of camera are described in the chapter ‘On the Use of the Camera Obscura for Drawing’, with its own pagination, 1–37. Our tent camera follows broadly Fig.77, Plate 32.
- 22 Gioseffi, *op. cit.*, 43, Fig.36.
- 23 Luca Carlevarijs, *Le Fabriche e Vedute di Venetia* (Venice, 1703).
- 24 André Corboz, *Canaletto: Una Venezia Immaginarica*, vol.I, part 2, section 5 (Milan: Electa, 1985), 188–239.
- 25 See Constable and Links, *op. cit.*, 70, 73.
- 26 Gioseffi, *op. cit.*, 36.
- 27 Several instances are noted by Corboz, *op. cit.*
- 28 Kenneth Clark, *Landscape into Art* (New York: Harper and Row, 1976), 65.
- 29 Tim Jenison, ‘Reconstructing Vermeer’s *View of Delft*’, currently in press.
- 30 See Arie Wallert, ‘Painting methods of Jan van der Heyden’, in Peter C. Sutton, *Jan van der Heyden (1637–1712)* (New Haven: Yale University Press, 2007), 91–103.
- 31 In *The Works of Sir Joshua Reynolds*, ed. Edmond Malone, 3 vols. (London: T. Cadell, Jr, and W. Davies, London, 1801): see vol. II, 79, where Reynolds reports seeing a Van der Heyden in Amsterdam, ‘his best’, a view of the church of S. Andreas in Düsseldorf.
- 32 See *Caricature di Anton Maria Zanetti*, catalogue of an exhibition at the Fondazione Cini, no.326, ed. Alessandro Bettagno (Venice: Neri Pozza, 1969).
- 33 Marieschi’s painting was exhibited in Oglethorpe University Museum of Art’s 1997 exhibition *The Grand Tour: Landscape & Veduta Paintings Venice & Rome in the 18th Century*, and appears on the exhibition webpages: <https://museum.oglethorpe.edu/exhibits/michele-marieschi-view-camposs-giovanni-e-paulo-calleoni-monument/> [accessed 09.10.23].
- 34 The 64 manuscript volumes of the diary are now in the library of the Correr Museum. Extracts were published in *Notizie d’Arte tratte dai Notatori e dagli Annuali del N.H. Pietro Gradenigo*, ed. Lina Livan (Venice: La Reale Deputazione editrice, 1942). The translation here is by Moschini. The Englishman has not been identified.
- 35 See for example J.G. Links, *Canaletto and His Patrons* (London: Paul Elek, 1977), 96. Also George A. Simonson, who writes that ‘Guardi’s aims in art differ so much from the more methodical and scientific ones of his master [Canaletto]’: *Francesco Guardi 1712–1793* (London: Methuen, 1904), 26.
- 36 John Ruskin, *Modern Painters* (London: Smith, Elder & Co., 1843). Ruskin declared that Canaletto ‘professes nothing but a coloured Daguerreotypism’. But there are ironies here. The three paintings that he cites are not by Canaletto, but by Bellotto, Marieschi, and an unknown artist. Also, Ruskin took Daguerreotypes himself and on occasion copied them precisely in drawings.