ALLEGORY, REALISM, AND VERMEER’S USE OF THE 
CAMERA OBSCURA

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Abstract

Critics of the proposal that the Dutch painter Johannes Vermeer used the camera obscura extensively in making his pictures of domestic scenes have argued that this cannot be the case, since his compositions are not 'photographic snapshots' but are very finely judged and balanced; his subject matter draws on the traditional motifs of Dutch genre painting; and the pictures are filled with complex allegorical and symbolic meaning. In this paper it is argued that all these are indeed characteristics of Vermeer’s oeuvre, but that the artist produced them through the transcription of optical images of tableaux, set up by arranging real furniture and other ‘props’ with extreme care, in an actual room in his mother-in-law’s house.

My book Vermeer’s Camera is devoted to the proposition that the great Dutch artist Johannes Vermeer (1632-1675) made use of the camera obscura as an aid to painting. In the book I describe how it is possible to reconstruct the three-dimensional geometry of the rooms that appear in ten of the painter’s views of domestic interiors. This can be done with considerable precision in Vermeer’s case by reversing, in effect, the normal procedures of perspective drawing. The absolute scale of each scene can be determined, because Vermeer includes depictions of a large number of recognizable, real objects: pieces of furniture, maps, and musical instruments. (This assumes of course that he represented these objects at their actual sizes.) Some examples are illustrated below. The ten paintings in question depict spaces which turn out, geometrically speaking, to be one and the same room, with the same dimensions; the same windows with the same distinctive ‘squares and circles’ pattern of leading; the same pattern of ceiling beams, where these

1 Philip Steadman, Vermeer’s Camera. Uncovering the Truth Behind the Masterpieces (Oxford, 2001); see in particular Chapter 5, 73-100, “Reconstructing the spaces in Vermeer’s paintings.”

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are visible; and similar square floor tiles, set always on the diagonal. (The patterns, colours and sizes of the tiles vary, but the common underlying grid is invariant.) The Music Lesson, of all pictures in this group, gives the widest-angle and so the best view of the room (Figure 1).

Figure 2 shows a plan of the room with the viewpoints of six of these pictures marked by small circles. The window wall is to
Two of the windows are visible in *The Music Lesson*. The far wall of the room, seen frontally, is always blank—without doors or windows. The room’s back wall is not seen directly in any picture, but it can just be glimpsed in the mirror that hangs on the far wall in *The Music Lesson*. Its position can thus be determined. The diagonal lines mark, in plan view, the ‘visual pyramid’ which contains everything visible in the left of the view, in every case.\(^2\) (Two of the windows are visible in *The Music Lesson*.)

Fig. 2. Plan of room depicted in ten of Vermeer’s interiors. The small circles mark the viewpoints of six of these pictures: (a) *The Girl with a Wineglass*, (b) *The Glass of Wine*, (c) *Lady Writing a Letter, with Her Maid*, (d) *Lady Standing at the Virginals*, (e) *The Music Lesson*, (f) *The Concert*. The diagonal lines mark the extent of what is visible in each picture.

\(^2\) In some of the paintings in this group no window can be seen; but the light always comes from this direction.
in the picture in question, and whose apex is as the viewpoint. When these lines are carried back, through the viewpoint, to meet the back wall, then in each case they describe a rectangle on that wall. For every one of these six paintings, _that rectangle is almost exactly the same size as Vermeer’s canvas_. Here is the very strongest indication one could wish for (it is tempting to say proof) that Vermeer was using a camera obscura. This would have been the very simplest kind of booth-type camera, where the artist works inside the booth, and the booth’s back wall serves as the projection screen. The paintings are the same size as the projected optical images, because Vermeer has traced them.

Figure 3 gives an indication of what Vermeer’s camera might have looked like. The viewpoints of the pictures, though they fall in the same small area, are not all at the same exact position, as Figure 2 shows. Clearly the lens could be moved. It may be that the front wall of the booth was itself moveable. Perhaps it was made from a curtain. The image projected directly onto the wall is upside-down, and (when turned right way up) is also mirrored left to right. In _Vermeer’s Camera_ I discussed some of the problems that this mirror inversion might have created for the painter. I rejected one possible arrangement for room and camera (different from Figure 3) in which the resulting image would _not_ be mirror-reversed (although it would still be inverted). More recently however I have changed my mind. In essence, this second possible arrangement involves moving the camera to the opposite end of the room. Since the windows, floor tiles and ceiling beams are all symmetrically positioned, this has the effect of ‘mirroring’ the entire room in the optical image. The idea is explained more fully in a separate paper. The attraction of this alternative set-up is that, had Vermeer used it, he would have been able to trace _and paint_ directly onto canvases hung on the camera’s back wall, and produce pictures with the orientations of his actual works.

As mentioned, there are depictions of many real objects introduced by Vermeer into his paintings, surviving examples of which

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3 Steadman, _Vermeer’s Camera_, 111.
4 Philip Steadman, ‘Vermeer and the Problem of Painting Inside the Camera Obscura’, _Bildwollen des Wissens_, 2.2 (Berlin 2004), 76-86. The issue is also discussed at some length at www.vermeerscamera.co.uk. See in particular Philip Steadman, _Vermeer’s Camera: afterthoughts, and a reply to critics._
Fig. 3. Possible arrangement for Vermeer’s camera obscura, in the form of an enclosed booth, with the lens in the front wall projecting an image onto the back wall.
can be found today in museums and libraries. These items can be measured, obviously, and their geometry and dimensions compared with the shapes and sizes derived from the perspective reconstructions. There are some minor anomalies; but in general Vermeer is fanatically faithful to these real appearances. In *The Music Lesson*, the virginals are recognisable as the work of the celebrated Antwerp firm of Ruckers. Figure 4 illustrates a very comparable virginals from the collection of the Rijksmuseum in Amsterdam. The two stands, which are separate from the actual virginals cases, are different. But the printed-paper patterns on the cases, with their Latin mottoes and motifs of seahorses, are closely similar. There is another almost identical instrument in the Musée Instrumental du Conservatoire in Brussels.

Two designs of chair are recognisable. One has brass lions’ heads on the seatback, as in *The Music Lesson*. The other has a plain square back and is upholstered in tapestry or *petit point* with a pattern of leaves and flowers. Examples of both types of chair are stored in the attics of the Prinsenhof Museum in Delft. Figures 5 and 6 compare photographs of the real chairs with Vermeer’s versions in *The Glass of Wine* and *The Concert*. Notice how carefully Vermeer depicts the profiles and mouldings of the legs and rails. The perspective reconstructions of Vermeer’s versions give dimensions within one or two centimetres of the actual chairs.

Tables of several different sizes appear, and some of them, like the table in *The Music Lesson*, are completely covered in carpets, so that it is impossible to know their precise appearance. But there is a characteristic design of heavy table leg with a globular foot, a fat vase-shaped moulding at the ‘knee’, and rectangular sections at ‘thigh’ and ‘ankle’, that appears in at

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8 I am grateful to Marc van Leusen and the Museum’s staff for locating the chairs, and to Marc van Leusen for taking the photographs in Figures 5 and 6, and making measurements. The Rijksmuseum in Amsterdam also has an example of the chair with the lions’ heads: see R. Baarsen, *Dutch Furniture 1600-1800* (Amsterdam and Zwolle, 1993), 7.
Fig. 4. Virginals in the collection of the Rijksmuseum, Amsterdam (reproduced from P. T. A. Swillens, Johannes Vermeer: Painter of Delft 1632-1675 (Utrecht and Brussels, 1950), plate 55a), for comparison with the instrument in The Music Lesson.
Fig. 5. Photograph (courtesy Marc van Leusen) of lion’s head chair in the collection of the Prinsenhof Museum, Delft, for comparison with Vermeer’s painted version in *The Glass of Wine.*
Fig. 6. Photograph (courtesy Marc van Leusen) of tapestry-covered chair in the collection of the Prinsenhof Museum, Delft, for comparison with Vermeer’s painted version in *The Concert.*
least five paintings. Figure 7 shows its depiction in *The Concert*, compared with a photograph of a seventeenth-century table of identical design in the Rijksmuseum.9

Then there are the maps and globes that feature in four of the interiors under consideration, as well as in several others of Vermeer’s paintings. The art historian James Welu has identified all of these and has found existing copies in library collections.10 The maps were printed in sections onto small sheets of paper, which were then pasted together, and could be mounted on canvas backings. Figure 8 compares a detail from *Soldier and Laughing Girl* with an actual copy of Balthasar van Berckenrode’s map of Holland and West Friesland of 1620.11 See how Vermeer’s version is faithful to every cartouche, every last little sailing ship, even the pages of descriptive text pasted below. Of the maps featured in the paintings for which perspective reconstructions were made, the dimensions of Vermeer’s version of Claes Jansz. Visscher’s map of the Seventeen Provinces of the Netherlands, which features in *The Art of Painting*, are within 3 or 4% of the original. Those of his version of Joan Blaeu’s map of Europe in *Woman with a Lute* are within 5%. In the painted maps one can sometimes even make out the cracks or changes of tone between adjacent printed sheets.

Finally, besides maps, Vermeer also shows paintings hanging on the far wall. As in genre pictures by many of Vermeer’s contemporaries, the subject matter of these ‘painted paintings’ serves often to counterpoint or comment on the activities and relationships of the figures in the scene itself. A woman reads a love letter: a stormy seascape in the background reminds us that the course of true love is never smooth. In Vermeer’s case, however, his ‘painted paintings’ are rendered in the recognisable styles of other Dutch artists; and in at least four cases the very painting can be identified. Figure 9 for example shows Vermeer’s *The Concert* into which he introduces a reproduction of Dirck van Baburen’s *The Procuress* (Figure 10), a picture that is now in the Museum of

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9 The five pictures are *The Glass of Wine, The Girl with a Wineglass, Woman With a Lute, The Concert*, and *The Art of Painting*. There are other seventeenth-century tables, similar to that shown in Figure 7, in the Prinsenhof Museum.
11 Welu, “Cartographic sources”, 531.
Fig. 7. Seventeenth-century table in the collection of the Rijksmuseum, Amsterdam (reproduced from Swillens, *Johannes Vermeer*, plate 54a), for comparison with Vermeer’s table in *The Concert*.
Fig. 8. Map of Holland and West Friesland by Balthasar van Berckenrode, 1620 (reproduced from James Welu, “Vermeer: his cartographic sources”, *Art Bulletin* 57, 1975, 529-547, figure 2), for comparison with Vermeer’s version in *Soldier and Laughing Girl*. 
Fig. 9. Vermeer, *The Concert*, c.1665-6, collection of Isabella Stewart Gardner Museum, Boston (present whereabouts unknown). Oil on canvas, 72.5 × 64.7 cm.

Fig. 10. Dirck van Baburen, *The Procuress*, 1622, Museum of Fine Arts, Boston. Oil on canvas, 101 × 107.3 cm.
Fine Arts in Boston. Vermeer introduces another copy into Woman Seated at the Virginals. Vermeer and his father both dealt in paintings; and the painter’s mother-in-law, Maria Thins, with whom he lived after his marriage, also had a picture collection. When Vermeer died, an inventory was made of the contents of Maria Thins’s house. The descriptions of the paintings are very terse, but several have the same subject matter as Vermeer’s ‘painted paintings’. The more research is done on this question, the more of these pictures are positively identified—some of them only in the last few years.

Now it would be wrong to give the impression that Vermeer is some kind of automatic copying machine. The version of van Baburen’s The Procuress is at its true size in The Concert, for example; but the version in Lady Seated at the Virginals is much enlarged, and is also slightly stretched in the vertical direction.

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12 The perspective reconstruction of The Concert shows that the width of Vermeer’s version of Van Baburen’s The Procuress is exactly the same as the original. However, the height is slightly reduced. This might perhaps be explained by the fact that the ‘painted painting’ hangs at an angle to the wall.

13 The inventory is reproduced in J. M. Montias, Vermeer and his Milieu: A Web of Social History (Princeton, 1989), 339-344. The three most clearly identifiable candidates for the ‘painted paintings’ are “a cupid” (Girl Interrupted at Her Music and Lady Standing at the Virginals), “a large painting representing Christ on the Cross” (Allegory of the Faith), and “a bass viol with a skull” (A Lady Writing). “A small seascape” could possibly be one of the two paintings depicted in The Love Letter. There is also mention of “a landscape” which is of course an extremely vague description: but there are (different) landscape paintings hanging on the walls in The Concert, The Guitar Player, and The Love Letter. In addition, Maria Thins had inherited “a painting of one who sucks the breast” (Montias, Vermeer and his Milieu, 122) which seems almost certain to be the Roman Charity in Vermeer’s The Music Lesson.

14 For example Vermeer’s version of the Roman Charity, a subject treated by several seventeenth-century artists, closely resembles that by Christiaen van Couwenburgh of 1634 in The Hermitage in Saint Petersburg; see Johannes Vermeer, catalogue of an exhibition at the National Gallery of Art, Washington and the Royal Cabinet of Paintings Mauritshuis, The Hague, 1995-96, 132 n.4. The Cupid (see note 13) has been attributed to Caesar van Everdingen (see Johannes Vermeer, 199 n2). The Finding of Moses reproduced in Vermeer’s Lady Writing a Letter, with her Maid as well as in The Astronomer, was attributed by W. L. van de Watering to Sir Peter Lely (see Johannes Vermeer, 189 n2). Most recently in 2000 the landscape painting and the painted decoration on the lid of the virginals in Lady Standing at the Virginals have both been shown by Gregor Weber to be based on Pieter Groenewegen’s Mountain Landscape with Travellers of 1640 (unpublished information reported in M. Spliethooff and W. J. Hoogsteder, “Painting Discovered in Vermeer”, Hoogsteder Journal 7, September 2000, 10-19). Groenewegen was a friend of Vermeer’s father.
There are other instances where Vermeer makes alterations.\textsuperscript{15} Some Vermeer scholars have seized on these departures from actual appearances, to support an argument that he is not a slavish, literal realist.\textsuperscript{16} But the fact is that these departures are the exception rather than the rule. In The Astronomer, Welu has been able to identify the very book by the mathematician Adriaan Metius that Vermeer’s scholar has open on his desk; and by deciphering the page has determined that this is a copy of the second edition.\textsuperscript{17} How many seventeenth-century Dutch viewers (outside the Huygens family) would have had the knowledge to appreciate this ‘unnecessary perfectionism’?

Vermeer in the main, then, is precisely and rigorously faithful to his furniture, ‘painted paintings’ and maps. My demonstration of Vermeer’s use of the camera obscura rests on other evidence, as explained. But one could perhaps invoke at the same time a general heuristic: that “If it can be proved that a painting is a faithful representation of real objects in a real scene, then one should suspect optical methods.” Maybe this could be called ‘Hockney’s rule’. In the terms of Lüthy’s distinction in his paper in this volume between ‘strong’ and ‘weak’ versions of the Hockney-Falco thesis, such a rule points to the kind of evidence that would support the ‘strong thesis’, i.e. that optical tools have indeed been employed for tracing.\textsuperscript{18} Clearly the rule is not completely reliable, since there are other feasible means by which the precise appearances of real objects can be created in pictorial images—the leading candidate being of course the standard techniques of linear perspective. But when the rule applies, then an optical method must be at least a logical possibility. Certainly the converse argument can be, and has been, used against the strong Hockney-Falco thesis: where painted images depart sig-

\textsuperscript{15} Daniel Arasse for example points to changes made by Vermeer to Jacob Jordaens’s Christ on the Cross, in Allegory of the Faith (see Figure 11). Vermeer has omitted two figures, Mary Magdalene and a man on a ladder behind the cross. See Daniel Arasse, Vermeer: Faith in Painting (Princeton, 1994), 24-25.

\textsuperscript{16} Some examples in the writings of Arthur Wheelock are discussed in Steadman, Vermeer’s Camera, 147-48.


\textsuperscript{18} See Christoph Lüthy’s contribution to this fascicle, 315-22.
nificantly from the real subjects depicted, these cannot then be transcriptions from optical projections.

What of the room itself? In Vermeer’s Camera I speculated as to whether this might have been a room in ‘Mechelen’, the inn owned by the painter’s family. Another more plausible possibility is that it might have been a room in Maria Thins’s house, where Vermeer and his bride Catharina moved to live with her mother some time in the late 1650s. The ten paintings in question are usually given dates between 1658 and 1675 when Vermeer died. From the inventory of the contents of the house, it is clear that the artist was using a first-floor, north-facing room as his studio. Unfortunately neither Maria Thins’s house nor ‘Mechelen’ survive; and so I reluctantly concluded that it was not possible to say with confidence whether the room shown in the paintings was or was not in either of these two buildings. But I was wrong.

In 2001 a Delft architectural historian, Ab Warffemius, published a very convincing reconstruction of Maria Thins’s house. He used a nineteenth-century map which shows the site; a pictorial map from the seventeenth century; a drawing of the front facade by the topographical artist Abraham Rademaker; and the probate inventory, in which the bailiff, as it turns out, listed the rooms in order as he worked through the building, starting from the front door. Vermeer’s first-floor studio, in Warffemius’s reconstruction, is 6.6 metres long, exactly the dimension obtained independently from the perspective calculations. Warffemius’s estimate of the height is similar to that given in Vermeer’s Camera, if a little lower. Warffemius’s room has the same three windows shown by Vermeer—although he does not have much independent documentary evidence for this, since the Rademaker view takes in only one of the windows. The Vermeer specialist Walter Liedtke has claimed repeatedly, as ‘proof’ that Vermeer was not a literal realist, that his ceiling beams run in what is structurally the ‘wrong’ direction; and that no seventeenth-century Delft house has the form of ceiling that appears in The Music Lesson and two

19 Montias, Vermeer and his Milieu, 341. ‘First floor’ is used here in the British sense: that is, first above ground.

20 Ab Warffemius, “Jan Vermeer’s huis. Een poging tot reconstructie”, Delfia Batavorum: Elfde Jaarboek 2001 (Delft, 2001), 60-78. Of the three windows in the studio, only two are ever visible directly (as in The Music Lesson). All three however are reflected in the mirrored ball depicted by Vermeer in Allegory of the Faith (see Figure 10).
other pictures, where the beams are perpendicular to the window wall. But he is contradicted by Warffemius, an architectural historian, who shows ceiling beams in his reconstruction exactly as Vermeer depicts them. In fact this is precisely what one would expect for structural reasons, and what is indeed found in actual examples of unusually wide Delft houses like Maria Thins’s.

In all these respects then, Vermeer was certainly a realist. In the eighteenth and nineteenth centuries, Dutch art of the Golden Age was generally conceived, by critics, historians and foreign visitors alike, as a realistic mirroring of Dutch life. In Svetlana Alpers’s words, Dutch painters were imagined to have produced a portrait of their own country: “... its cows, landscape, clouds, towns, churches, rich and poor households, its food and drink”. In the twentieth century, art historians began to consider seventeenth-century Dutch paintings less as ‘mirrors’ or ‘snapshots’, rather as works of art in a much more considered sense. They analysed the pictures’ principles of composition, and their conventional themes—the ‘merry company’, the ‘vanitas’, the scholar in his study or the painter in his studio. In the 1960s and 70s a group of historians led by E. de Jongh mounted a powerful and for a time highly influential argument, that the realism of Dutch genre painting is only a surface realism, and that behind the surface lie a whole series of hidden emblematic and allegorical meanings. These need to be deciphered by reference to printed sources, in particular the illustrated emblem books which enjoyed a wide popularity at the time.

21 Walter Liedtke, review of Vermeer’s Camera in The Burlington Magazine, October 2001, 642-643 note 6 citing C. Willemijn Fock, “Werkelijkheid of schijn. Het beeld van het Hollandse interieur in de zeventiende-eeuwse genrerschilderkunst”, Oud Holland 112 (1998), 187-246. On this question of ceiling construction, Fock in fact confines her attention largely to one painting by Emanuel de Witte, in which, she says, the beams “do not run parallel to the façade as they ought to, but perpendicular to it.” Meanwhile Fock actually illustrates (Figure 1, p.188) a seventeenth-century room in the Centraal Museum in Utrecht that has the beams running towards the window wall. See also the talk given by Liedtke at the ‘Art and Optics’ conference, New York Institute for the Humanities, 1st/2nd December 2001, published at webexhibits.org/hockneyoptics; consulted April 2004.


23 See E. de Jongh, Zinne- en Minnebeelden in de Schilderkunst van de Zeventiende Eeuw (Amsterdam, 1967); and discussion in Alpers, Art of Describing, 229-233.
Figure 11 reproduces Vermeer’s *Allegory of the Faith*, perhaps his most heavily symbolic work, although some of the messages here are not hidden very deep. The woman herself of course personifies Faith. She echoes the posture of Mary behind her, looking up to Christ on the cross. She has the world under her feet, as in the emblem book *Iconologia* by Cesare Ripa, to which Vermeer seems to have referred when designing his allegory.\(^{24}\) The apple refers naturally to original sin, while the block of stone crushing the evil snake represents Christ himself, the cornerstone of the church. The mirrored sphere that hangs overhead, since it reflects in miniature the entire world around it, serves to symbolise the ability of human faith to comprehend God and his universal creation.\(^{25}\) This symbolism can be found explained in an emblem book by the Jesuit author Willem Hesius published in 1636.\(^{26}\)

For certain Vermeer scholars, Walter Liedtke most prominent amongst them, such features are clear evidence that Vermeer could *not* have been a camera user. Liedtke’s position is that it is a basic mistake even to imagine that Vermeer might have reproduced, in every detail, the exact appearance of the interior and furnishings of some actual house in Delft.\(^{27}\) (As we have seen, the evidence is against him here.) These are not snapshots of daily life in the Vermeer household. The paintings, according to Liedtke, are idealised imaginative constructs, at some considerable distance from naturalism. They deploy the traditional motifs of Dutch genre painting, and they are heavily freighted with allegorical and allusive significance. What is more—it is said in criticism of the camera theory—Vermeer’s compositions do not have the kind of casual, haphazard arrangement one might expect of ‘photographic’ images. On the contrary, they are characterised by a very carefully measured and resolved proportioning and balancing of shape against shape, to create those feelings of serenity and inevitability that are Vermeer’s hallmarks. These kinds of reasons mean that, for Liedtke and other critics, a camera technique is inconceivable.

My response is that these points about the paintings’ symbol-

\(^{24}\) Cesare Ripa, *Iconologia*, translated into Dutch by D. Pers (Amsterdam, 1644).
\(^{26}\) Willem Hesius, *Emblemata sacra de fide, spe, charitate* (Antwerp, 1636).
\(^{27}\) See for example Liedtke, *Burlington Magazine* and webexhibits.org/hockney-optics.
Fig. 11. Vermeer, Allegory of the Faith, c.1671-4, Metropolitan Museum of Art, New York. Oil on canvas, 114.3 × 88.9 cm.
ism, their finely-judged compositions, their reliance on traditional subject matter, are all perfectly valid: but that none of this is incompatible with a camera technique. Indeed they are all produced precisely through the use of the camera.

To come back to Allegory of the Faith: the painting of the Crucifixion is a reproduction (with minor changes) of a real work by Jacob Jordaens (Figure 12). Possibly it is the large picture of Christ on the cross belonging to Maria Thins, mentioned in the probate inventory.\(^{28}\) The inventory also speaks of an ‘ebony wood crucifix’, and ‘seven ells of gold-tooled leather’ seen here hanging on the far wall.\(^{29}\) The terrestrial globe is one of an edition published by Jodocus Hondius in 1618 (Figure 13).\(^{30}\) The chair is the lion’s head type. The mirrored ball must have been a real ball, because Vermeer paints a curved reflection—albeit in very soft focus—of the entire back of the room, which is in perfect perspective. This reflection shows the woman’s white skirt, sleeves

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\(^{28}\) Montias, *Vermeer and His Milieu*, 340.

\(^{29}\) Ibid, 340, 342.

\(^{30}\) Welu, "Cartographic sources", 542.
and decolletage, the Bible on the table, and some of the white floor tiles. Three windows are visible: one heavily curtained, one with a lower shutter closed, one with both shutters closed. It is just possible to make out a small illuminated part of the back wall—behind Vermeer, behind us the viewers. And below this patch of wall is an indistinct black rectangular shape: a distant glimpse, as I believe, of Vermeer’s camera booth. All this would have been an almost impossible feat of geometrical perspective construction, and must have been painted in front of an actual ball (or rather, its optical image), hung in the actual room.\footnote{Steadman, \textit{Vermeer’s Camera}, gives an account in Chapter 7 (“More evidence,}
There can surely be no doubt that this is a tableau, arranged in the upstairs room at Maria Thins’s house. Vermeer worked, I suggest, something like a nineteenth-century studio photographer setting up history or genre scenes—in imitation of paintings—using costumed sitters and props. The camera obscura served Vermeer precisely as a ‘composition machine’. What the camera does, as we know, is to collapse the three dimensions of the scene onto the two dimensions of the projection screen. Vermeer would have studied the camera image, the shapes of the objects and their shadows, the ‘negative spaces’ between objects; and worked on the compositions by moving the objects themselves—shifting the chair or the altar, pulling back the tapestry, asking his model to lift her eyes—until he was finally satisfied. His compositions are very far from casual ‘snapshots’. It might be mentioned in passing that this suggested method of Vermeer’s could account for the rather strained, artificial atmosphere of Allegory of the Faith. This is Vermeer’s most explicitly symbolic work, but at the same time, in the view of many critics, one of his least successful pictures. The explanation lies perhaps in the unsettling tension here, precisely, between the allegorical programme and the extreme realism with which its component elements are treated. Just how often might one expect to come across a dying snake in a bourgeois Delft home? As Alpers puts it (referring to Gerrit Dou’s The Quack), moral warnings or lessons “... are presented under the aspect of describing the world even though they contradict the look of actual situations in the world.” In other pictures, Vermeer’s allusive references tend to be much more elliptical and ambiguous. The Art of Painting escapes the problems of Allegory of the Faith, since we find no incongruity in the spectacle of a young woman dressed in the symbolic accoutrements of Fame, posing for an artist in his studio. It is perfectly explicit that she is a costumed role-

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from rebuilding Vermeer’s studio”, 118-134) of the construction of a scale model of the room and furniture, in which photographic simulations were made of several of the pictures in question, using a photographic plate camera in place of Vermeer’s camera obscura. These included a mock-up of Allegory of the Faith, with a miniature mirrored globe. The reflection of the room in this sphere, photographed from the correct viewpoint, provides an extremely close match, in geometrical terms, to Vermeer’s painted version (see Figure 53, p. 108).

Alpers, Art of Describing, 233.
playing model. About the personification of Faith, we are less sure.

We can contrast this mode of use of the camera obscura as a ‘composition machine’ by Vermeer, with Vanvitelli’s camera technique for piecing together his topographic views of Italian cities, as described by Lüthy elsewhere in this volume. 55 The evidence adduced here for the extreme consistency and accuracy of Vermeer’s painted rendering of the architecture of his studio and the appearances of his furniture and maps, suggests a close adherence to the camera image that is perhaps surprising for an artist of such prodigious technical skills. By contrast Vanvitelli, a lesser painter, felt able—as Lüthy shows—to alter and recompose the elements of his townscape pictures, even though their principal purpose was to act as factual records (‘highbrow postcards’).

I would make two points. First is that, in addressing a real landscape or urban view, the painter using a camera has no compositional choice—other than in the framing—if he wishes faithfully to record the actual scene. If he wants to make changes for aesthetic or psychological reasons, he can only achieve this by doing violence to the optical image. Vermeer in his interiors was not so restricted, since he could compose by moving his models and props. The room’s architecture was given, certainly. But even here he could hang tapestries and curtains, and open and close the shutters, in order to modulate the light and shadow. My second point is that Vermeer used the camera, as I believe, only in part to achieve correct geometrical outlines—the primary purpose that it served for Vanvitelli. Vermeer, I think, was much more fascinated by the luminous qualities of the camera image itself, and with the opportunities it offered for achieving, by imitation in paint, the uncanny truth to tone on which so many critics have remarked. As Lawrence Gowing says, many artists have used the camera obscura, but “Vermeer is alone in putting it to the service of style rather than the accumulation of facts.” 54 This was the reason, I would suggest, why Vermeer wanted actually to place his canvas and work on it beneath the optical image. Most artists who have employed the camera, like Vanvitelli, have seen its usefulness as an aid to drawing. In Vermeer’s can-

53 See Lüthy’s contribution to this fascicle, 328-34.
vases, paradoxically, there is no evidence of drawing or linear outline whatsoever. But Vermeer had no need to draw, since the camera image itself, falling on the canvas, served as his ‘drawing’.

The question of Vermeer’s compositional method is illuminated in a series of computer images produced by Yasuo Furuichi, who has been building three-dimensional computer models of the scenes in the paintings. Figure 14 reproduces *Girl Interrupted at Her Music*. Figure 15 shows a series of images of Furuichi’s model of the scene. Furuichi has worked in essentially the same way as myself, using a method of reverse perspective analysis of the paintings. He has taken my own dimensions for some of the

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35 Yasuo Furuichi, personal communication. I am grateful to Mr Furuichi for permission to reproduce these images.
Fig. 15. Images by Yasuo Furuichi (reproduced with permission) of a three-dimensional computer model of the room and furniture depicted by Vermeer in *Girl Interrupted at Her Music*. Images a, b and c show Vermeer’s painting faded out in stages, and the computer model, seen from Vermeer’s viewpoint, faded in. In this way, painting and model can be compared. Images d and e show the room and furniture from other viewpoints.
Fig. 15. Images by Yasuo Furuichi (reproduced with permission) of a three-dimensional computer model of the room and furniture depicted by Vermeer in *Girl Interrupted at Her Music*. Images $d$ and $e$ show the room and furniture from other viewpoints.
furniture. For this particular painting, since only a small part of the floor is visible, he has assumed a grid of tiles similar to those in the two closely related paintings, *The Glass of Wine* and *Girl with a Wineglass*. The accuracy of the match of Furuichi's computer model with the painting can be judged, as one is faded out, and the other faded in Figures 15a, b, c. Figures 15d and e show the scene from other positions in the room, away from Vermeer's viewpoint. From these angles it is possible to get an idea of how Vermeer arranged the table, the lion's head chairs, and the picture of Cupid—real objects, as we have seen—in preparation for painting. Viewed from these random points around the room this seems to be a rather haphazard, meaningless placing of pieces of furniture—*until* we come to Vermeer's viewpoint, when everything, so to speak, 'locks into place'. It is not just familiarity with Vermeer's original that creates this impression. It is a result of the intense care with which he has composed his tableau, as seen from the one privileged point in space, the lens of his camera.