National Gallery Technical Bulletin

Volume 15, 1994

National Gallery Publications
London

Series Editor: Ashok Roy

First published in Great Britain in 1994 by
National Gallery Publications Limited
5/6 Pall Mall East, London SW1Y 5BA.

British Library Cataloguing-in-Publication Data
A catalogue record for this journal is available
from the British Library.

ISBN 1 85709 049 7
ISSN 0140 7430

Edited by Diana Davies and Jan Green
Designed by Sally Jeffery
Digital colour plates produced by John Cupitt using the VASARI system and MARC computer software. Infra-red reflectograms acquired and computer-assembled by Rachel Billinge, Leverhulme Research Fellow. The VASARI and MARC projects are supported by the European Conmmunity's ESPRIT programme.

Printed in Great Britain by Lawrence-Allen, Weston-super-Mare

Front cover: *The Virgin and Child before a Firescreen*, detail of Plate 1, p. 20.

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The publication of this volume of the *National Gallery Technical Bulletin* has been made possible by the generous support of Mr and Mrs Frank Richardson of New York

Plate 1 Carel Fabritius, *A View in Delft, with a Musical Instrument Seller's Stall* (NG 3714), 1652. Canvas, 15.5 × 31.6 cm. After cleaning and restoration.

Plate 2 Carel Fabritius, *A View in Delft*. Before cleaning.

Carel Fabritius' *A View in Delft*: Some Observations on its Treatment and Display

LARRY KEITH

Carel Fabritius (1622–54) received his most important artistic instruction in Rembrandt's studio in Amsterdam in the early 1640s, when Samuel van Hoogstraten was also one of the master's pupils. By 1650 Fabritius had settled in Delft, where he died in 1654 as a result of the explosion of the city's gunpowder magazine.

Very few of his paintings have survived, but they are enough to have secured his general reputation as Rembrandt's most gifted and innovative student whose works were of great importance in the development of other Delft painters such as Vermeer and de Hooch. The National Gallery is fortunate in having two paintings by him, the *Self Portrait* of 1654 (NG 4042) and the signed and dated *View in Delft with a Musical Instrument Seller's Stall* of 1652 (NG 3714; Plate 1). *The View in Delft* is the only surviving example of his documented interest in illusionistic perspective painting. Its exaggerated perspective and foreshortening have given rise to much debate on its original function and method of display (see below).

Conservation treatment

The picture was painted on a fine weave canvas which was glued on to a walnut panel at some later date.[1] The canvas edges do not precisely correspond to the panel dimensions, and approximately 1 mm of canvas had been turned over the right edge and bottom right side of the panel, resulting in the canvas not being correctly squared to the panel, so that the whole composition ran slightly down toward the right side. The glueing procedure was crudely done, and there were numerous hard lumps visible in the picture from deposits of glue or some other material trapped between the canvas and panel (Fig. 1)

While no structural treament had been carried out since the painting entered the Gallery in 1922, the picture was partially cleaned shortly after acquisition, work having been done mostly in the area of the sky.[2] As a result, the natural resin varnish, already quite yellow in the sky, was particularly thick, cloudy and discoloured in darker areas such as that containing the instrument seller. The paint layers showed considerable local abrasion, most seriously in the ceiling of the stall, the church and the canal. The figure had been retouched extensively, particularly in the hat, cheek and chin. Actual paint losses, however, were small and few in number (Fig. 2).

It was decided that the picture should be removed from its panel after cleaning and relined, in order to improve its appearance. It was hoped that new evidence for its original method of mounting might emerge from an examination of the back of the canvas during the course of structural treatment. However, it should be emphasised that the decision to remove the canvas was based primarily on aesthetic, rather than art-historical considerations, in particular the fine detail and high finish of the painted image that justified the effort to improve its lumpy and irregular surface.

The natural resin varnish layers and earlier retouchings were soluble in acetone and white spirit mixtures. Although the sky showed signs of having been rather harshly cleaned in the past, areas of damage and abrasion were essentially the same as anticipated through earlier examination (Fig. 2). The aesthetic gains of cleaning were considerable, both in terms of the breadth of the overall chromatic range given by the relative re-emergence of the blue tones and in the recovery of specific painterly details. One such detail had been deliberately suppressed by an earlier restorer: a pale blue highlight, painted on the belly of the lute as the reflection of the sky, had been painted over with a resinous retouching (Plate 2). Other details were obscured by the discoloration and poor saturation of the old varnish layers; the effects of surface textures like the gloss of the viola da gamba soundboard, the illusion of spatial depth implied by the subtle diminution of the receding cobblestones, and the fine detail of figures and architecture on the distant canal were all heightened as a result of cleaning, with the result that, in this picture, Fabritius emerges as more of a *fijnschilder* (fine painter), in the general sense of the degree and sophistication of finish, than had been apparent earlier.

After cleaning, the picture was given a temporary protective varnish. It was next given three protective facings of wet-strength tissue as protection and cushion during the structural treatment.[3] After a full photographic documentation the labels were removed from the reverse of the panel and retained for the Gallery archive. The picture was then placed face-

Fig. 1 Carel Fabritius, *A View in Delft*. Raking light photograph.

Fig. 2 Carel Fabritius, *A View in Delft*. After cleaning, before restoration.

down and secured for the removal of the panel. The walnut wood was removed from the reverse with hand gouges, carving down evenly across the entire surface, a process slightly complicated by the numerous knots and local changes in the direction of the wood grain. The final remnants of wood were removed with metal scrapers, which were also used along with scalpels to remove the the thick layer of animal glue used to stick canvas and panel together. At this stage the remains of an earlier glue layer was noted and photographed (see below). The reverse of the canvas was remarkably well preserved, showing little discoloration or accumulation of dirt; it must have been well protected from the environment since shortly after the picture's completion. The canvas showed little or no penetration of the glue used to attach it to the walnut panel, and presumably was placed dry on to the pre-glued panel after the adhesive had begun to set.[4]

The fact that the reverse of the canvas had apparently never been fully wet with glue was an important factor in the selection of the materials and technique for lining. While the careful and controlled application of moisture, heat and pressure is important in reducing surface deformations in the paint and canvas, it was judged that, in the case of *A View in Delft*, this technique was best applied in a separate phase of moisture treatment using the Willard multi-purpose low pressure table, giving optimal control over the degree of moisture applied.[5] Since the reaction of the canvas to the fuller wetting associated with the various glue-paste lining techniques could not be satisfactorily predicted, it was decided to line the picture with Beva 371, a non-aqueous synthetic adhesive, using a non-penetrating 'nap-bond' technique with minimum adhesive impregnation and therefore maximum reversibility.

Before moisture treatment, the upper two layers of facing tissue were removed, leaving one in place. The reverse of the canvas was then very lightly misted with water and placed face-up on a thin woven polyester interleaf on the preheated (35°C) table surface, which was covered with a thin sheet of Melinex, after which the pressure was reduced to 12 mbar. Further humidification was achieved using the table's internal humidification system,[6] and during moisture treatment the most serious surface deformations were also treated locally from the front with a heated spatula while the picture was under light vacuum. After about fifteen minutes the pressure was increased to between 20 and 25 mbar, while the table's dehumidification system was used to return the picture to ambient relative humidity conditions over a period of several hours. During the drying process the table heaters were turned off.

The moisture treatment had affected a noticeable improvement in the picture surface, although the worst surface deformations were by no means eliminated. It was judged that the risk of 'moating', that is, pushing in the paint surrounding a raised area as a consequence of attempts to flatten the highest deformations, was greater than the likely improvements to be gained from further surface treatment, and therefore the picture was ready to be lined.

After removal of the last facing layer, the picture was laid onto a pre-stretched linen canvas that had been prepared in advance with a build-up of Beva 371 and lined using the Willard table. Impregnation of the original canvas with the lining adhesive was avoided by activating the table's cooling system as soon as the adhesive had reached its melting point.[7] The picture was then cooled to room temperature while under light vacuum (16 mbar) over a period of several hours. The lined picture was then stretched over a purpose-built wooden stretcher that could be keyed-out. Retouchings were done using dry pigments and Paraloid B-72 resin over Ketone–N varnish.

Observations on its original display

Over the last fifty years *A View in Delft* has been the subject of much scholarly debate.[8] Its unusual compositional format and distortions of form, together with contemporary documentary evidence, have led to a general consensus that the picture was part of a perspective box or peepshow, or at the very least that the relationship between constructed perspective and natural vision was central to its original meaning. The majority of scholars have favoured the perspective box theory, most recently discussed by Walter Liedtke in an article published in 1976.[9]

In Liedtke's reconstruction Fabritius' canvas would have been mounted on a hemicylindrical panel and placed at the back of an equilaterally triangular box (Fig. 3).[10] The picture would have been viewed through a hole placed in the opposite angle, with diffuse light admitted through the top, possibly through stretched paper.[11] The resulting image (Fig. 4), with the viewing angle made increasingly oblique towards the sides, would appear with its apparent distortions and discrepancies of scale corrected, and bear a much greater topographical fidelity to the view as seen from the actual vantage point. As Liedtke describes, the lateral stretching of peripheral elements like the front of the viola da gamba or the exaggerated distance between the figure's ear and chin are resolved into convincing, naturalistic representation. The odd, curving away impression of the row of houses on the receding canal at the right is transformed into an accurate depiction of the more modestly scaled Vrouwenrecht (Fig. 5). The left wall recedes along, not across, the Oude Langedijck, and the trellis projects in a clear right angle to form a coherent space in

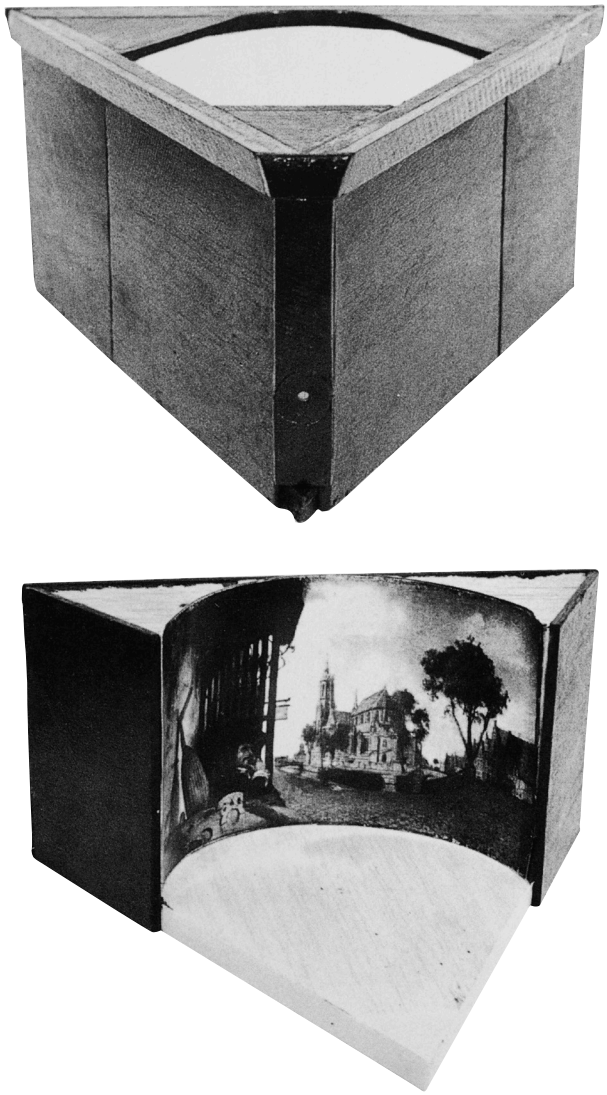

Fig. 3 Carel Fabritius, *A View in Delft*. Peepshow reconstruction proposed by Walter Liedtke.

which the figure sits, and before whom the lute now functions as an effective three-dimensional *repoussoir*. Furthermore, the lack of binocular depth perception afforded by the single eyepiece intensifies the illusionism of the constructed space, a deception that is difficult to appreciate to full effect without a three-dimensional model.

No surviving perspective box, or *perspectiefkas,* can be attributed to Carel Fabritius, but his interest and activity in this area are indicated in a number of contemporary inventory references, although they refer to works either lost or already incorrectly attributed.[12] Both Arnold Houbraken and Samuel van Hoogstraten, his fellow student in the Rembrandt studio, refer to Fabritius' mastery of perspective and *trompe-l'oeil* illusion,[13] subjects which were also explored in several perspective treatises published or available in seventeenth-century Holland. The particular relevance of these treatises to *A View in Delft* lies not in their exposition of basic perspective techniques but in their interest in relating them to how the eye sees.[14] The representation of views with multiple distance points, or points of convergence, as a means of depicting views which simulate the assembled image of the rapidly scanning eye was a prime topic for perspectival theorists like Vredeman de Vries, who illustrated many such constructions in his *Perspective* of 1604–5, and has been demonstrated to be present in the works of artists like Houckgeest and Saenredam.[15] In its curved format *A View in Delft* gives a very clear impression of two divergent points of configuration: the Oude Langedijck and the Vrouwenrecht, which actually do form a fifty-five degree angle (Fig. 5). The visual tensions and ambiguities resulting from the extension of traditional perspective techniques to replicate our natural perception of three-dimensional space are greatest in just the sort of wide-angle view depicted in *A View in Delft*; in a sense its most basic compositional premise is a major aspect of the subject, treated with unprecedented sophistication.

This association between *A View in Delft* and contemporary Dutch scientific exploration of optics is pressed much further by Arthur Wheelock, who disagrees with the basic peepshow construction proposed by Liedtke.[16] He relates the painting to contemporary artistic interest in optical devices such as mirrors, lenses and the *camera obscura*, an interest documented in Hoogstraten's writings and often associated with paintings by Vermeer. He has proposed that Fabritius viewed the site through a double concave lens to create his wide-angle image, with the resulting picture always intended to be seen flat. A view of the actual site through an eighteenth-century double concave lens reproduces what Wheelock sees as the major distortion in *A View in Delft,* the appar-

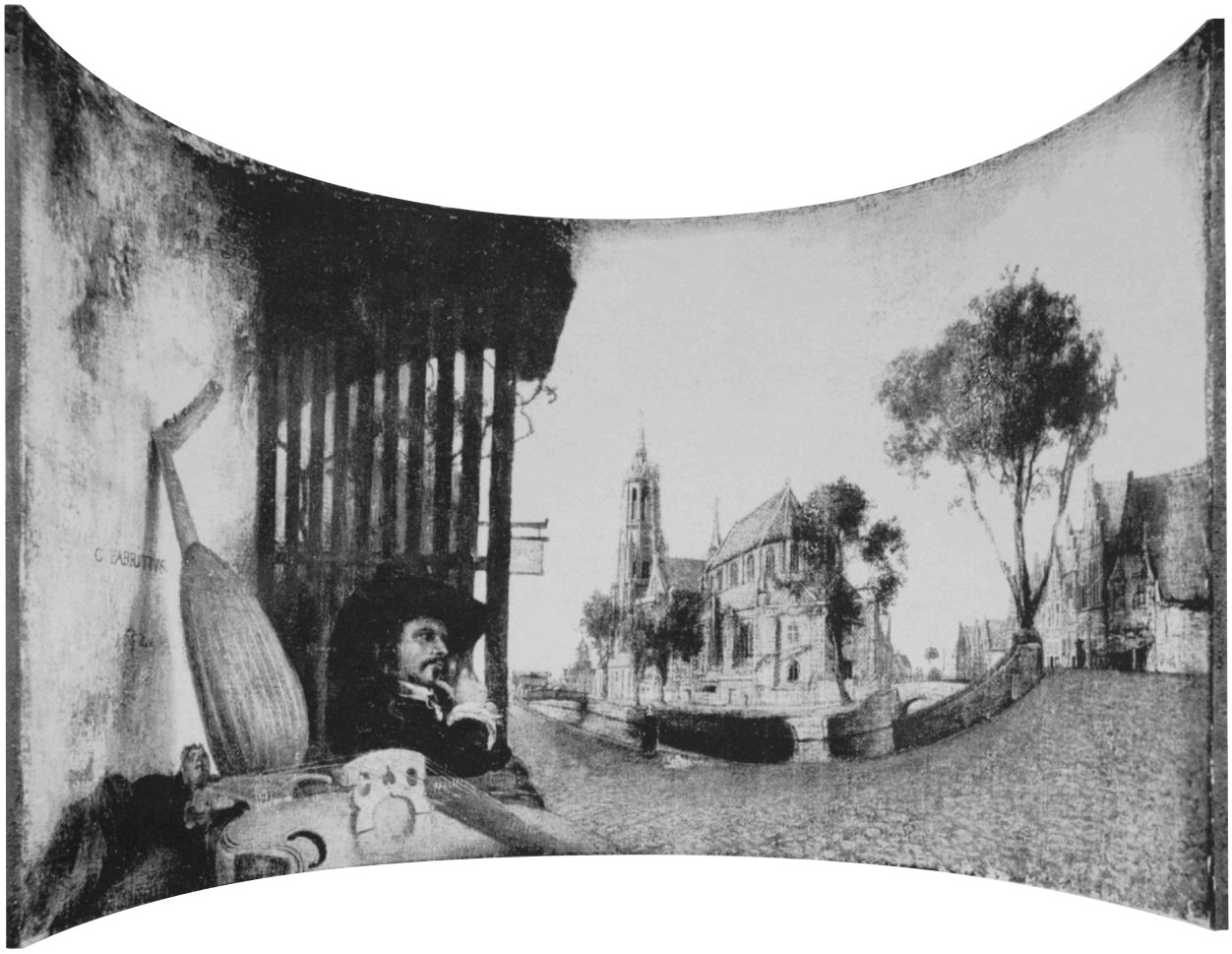

Fig. 4 Carel Fabritius, *A View in Delft*. A photograph of the painting bent in a semi-circle to suggest the changes in form in the curved configuration. The camera height was fixed at the horizon level of the image. The fixed focal point of the camera lens compresses the intended anamorphic distortions of the outer sections of the picture slightly more than would be experienced from the same physical position by the cumulative image produced by the single, scanning human eye.

ent remoteness of the nearby Nieuwe Kerk as compared to the actual viewing experience from the site (Fig. 6). 'Fish-eye' distortions of parallel verticals were corrected by slanting the lens upward,[17] which in turn caused distortions in the foreground that were masked with the projecting viola da gamba and other foreground elements, placed intuitively by the artist in an 'additive' composition process. The final result of this process is not now visible, because, according to Wheelock, the pattern of cusping or scalloping of the canvas weave along the picture edges indicates that the picture was trimmed by at least 8–10 cm along its right and bottom edges.[18] Ambiguities of scale and distortions of form, which would certainly have been even greater with the inclusion of the alleged missing areas, were not defects largely corrected through manipulation of the canvas but an intended 'freedom from the restraints of perspective theory', the results of which were exploited 'not only for its naturalistic qualities but also for its distinctive psychological implications'.[19]

Whether Fabritius' achievement represents an escape from perspective conventions or an extension of them seems open to question, and while there is nothing to preclude the possibility of experimentation with optical instruments, Wheelock's explanation remains the minority opinion.[20] Wheelock sees the diminutive size and remoteness of the Nieuwe Kerk as the product of the lens distortion, but Liedtke is correct in maintaining that, seen with one eye at the close distance dictated by the confines of the box, the church dominates the vista to a surprising degree. Additionally, the distortion of verticals caused by the double lens, even when corrected, still seems at odds with a picture where the overriding impression is of a unipolar, laterally oriented anamorphic projection roughly similar to parts of Hoogstraten's peepshow in the National Gallery.[21] Even as used by Fabritius toward different ends, traditional anamorphic distortion accounts for the distortions present in the now-flattened *View in Delft* in a more simple and direct way, and is perhaps all the more remarkable for the subtlety with which it would have been originally used in the service of pictorial illusion.

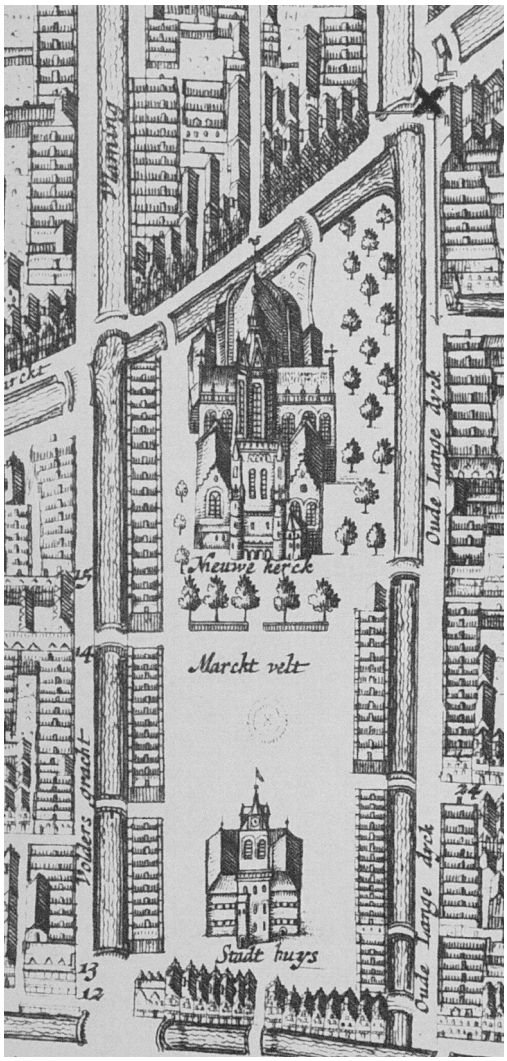

Fig. 5 Detail of a plan of Delft by D. F. de Wit (*Delft Batavorum*; Amsterdam, 1670[?]). The 'X' in the upper right marks the viewing point of Fabritius' composition.

Fig. 6 The Nieuwe Kerk, *c.* 1900.

Investigation of the physical object and of the painting technique has proved relevant to discussion of the issue of function and display. Examination with the infra-red videcon system (Fig. 7)[22] reveals a clear underdrawing of a more or less consistent level of finish throughout, most clearly visible in the lute and its shadow, the viola da gamba, and the distant architecture. Whatever method was used to arrive at the composition, the image seems to have been drawn as a whole on the lead-white primed canvas. Even if compiled additively, as Wheelock asserts,[23] it must have been more or less finalised in some sort of preliminary stage, as there are no major changes of drawn form in peripheral, overlapping elements like the (drawn) gamba and lute.[24] However, the most recent infra-red technology clearly supports Wheelock's observation of the change in the figure.[25] It was originally placed in a higher, standing position, and seems to have been executed to some degree in paint before being changed to its present position. Yet the information provided by analysis of the painting technique, while interesting, brings us little closer to solving the question of the original mounting. Fabritius' materials and method seem conventional, and there is nothing in the evolution of the composition or the build-up of paint that confirms or refutes any of the theories about its display. However, other physical evidence uncovered during the recent restoration, while not conclusive, is more consistent with Liedtke's peepshow thesis.

Examination of the canvas itself is of some relevance to the *perspectiefkas* question. Wheelock's assertion that the canvas has been trimmed is not consistent with an examination of the canvas cusping. Canvases were often stretched and primed in large sizes, to be trimmed later to the desired picture size; after drying this separate, earlier application of ground, however, is enough to hold the pattern of distortion of the canvas weave in place in its new size. Examination of the cusping of *A View in Delft*, which is visible in an X-radiograph (Fig. 8), indicates only that its canvas was primed in a larger size than was later used for the painting, and also that the piece was probably taken from near a corner of the primed fabric, resulting in greater cusping along adjacent sides.[26] In addition, removal of repaint during restoration showed it to have been painted completely only up to the bottom border, which itself would be in keeping with Liedtke's hypothesis that the foreground would have been continued on the base of the box in an extreme anamorphic projection.

If the general premise of a triangular perspective box is accepted, the use of canvas would allow the best combination of flexibility and strength necessary for the curved configuration, whether achieved before or after the painting stage. The use of canvas would be

Fig. 7 Carel Fabritius, *A View in Delft*. Infra-red reflectogram mosaic.

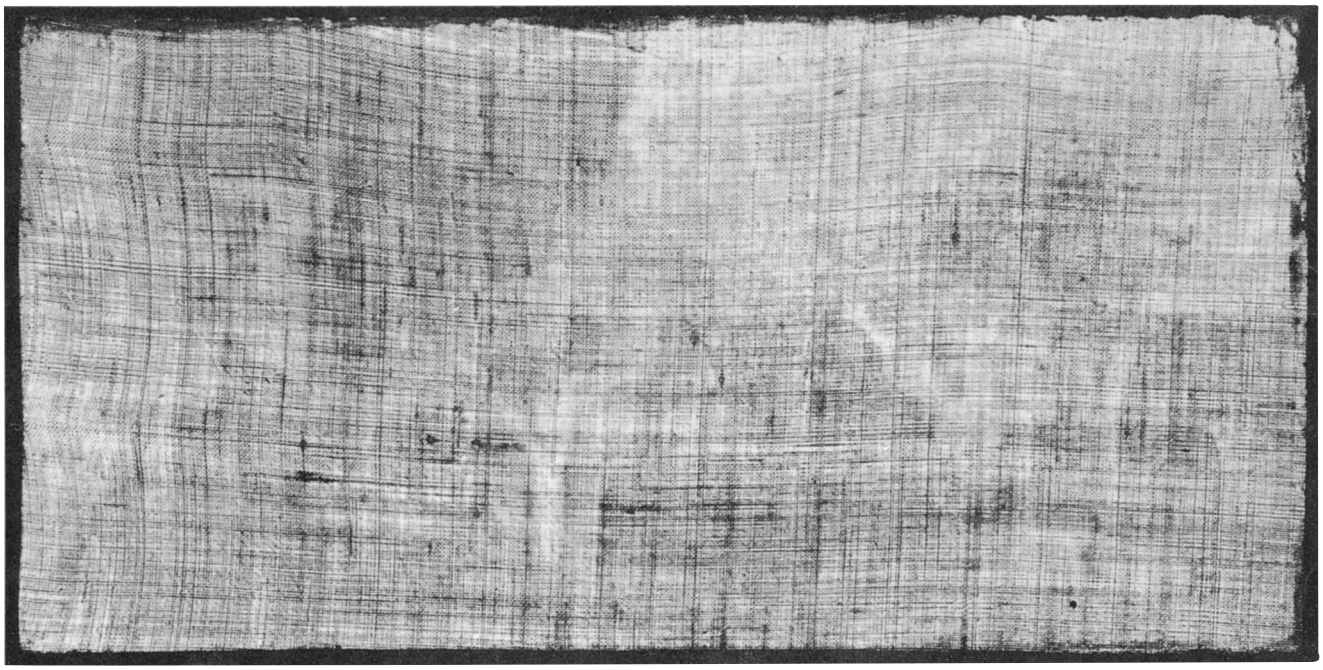

Fig. 8 Carel Fabritius, *A View in Delft*. X-ray photograph.

consistent with Wheelock's thesis as well, except that the canvas and paint do show signs of having been bent for some time in the past. A photograph taken in raking light (Fig. 1) clearly shows a series of raised parallel vertical ridges, which are the high points of a pattern of concave scalloping of paint and canvas (as seen from the front), not unlike the warping of separate planks of a wooden panel construction. In this case, however, the 'warping' is concave, and the sum of the individual deformations would produce a general curve of the canvas and paint with the lateral edges pushed toward the viewer in a manner suggested by Liedtke's reconstruction. The fact that these ridges are unidirectional and are in both canvas and paint layers, with no associated lifting or flaking of paint, effectively rules out canvas shrinkage from

Plate 3 Carel Fabritius, *A View in Delft*. Detail of canvas reverse during treatment showing traces of the later wood support and two distinct layers of animal glue. The greenish coloration of the lower layer is due to contact with a copper panel.

glueing operations as their cause. Furthermore, these deformations occur at right angles to the wood grain of the walnut panel to which the canvas was later glued (see above), and are large enough relative to the panel dimensions to make it very unlikely that they could have been caused by any cycles of wood movement in response to changes in relative humidity.

The back of the canvas also showed some evidence of the picture's original mounting. As previously stated, there were clear remains of an earlier adhesive layer, beneath the glue used later to attach the canvas to its walnut panel, which was easily distingishable by its unusual green colour (Plate 3). Analysis showed this to be a copper-protein complex, the result of long-term contact between animal glue and copper, most plausibly explained by the picture having been glued to a copper panel.[27] The quite unusually unsoiled and well-preserved state of the reverse of the fabric argues for this having been done early in the picture's history. Glueing canvas to copper, although an unusual procedure, does not in itself mean that the picture was curved; if it was, however, copper would be a good choice of material since it is easily bent or hammered into the desired shape, and certainly would have been readily obtainable in this size at the time of painting.

While the physical evidence remains circumstantial, it clearly supports the type of reconstruction proposed by Liedtke, for which there is solid evidence in contemporary artistic theory and practice. Yet even though the new information supports this view, the exact configuration of *A View in Delft* remains unknowable; any attempt actually to remount the picture in a perspective box would be conjectural and therefore unsatisfactory in its detail. Furthermore, remounting the picture would pose serious practical problems of public access, as well as problems of lighting and the durability of the now aged paint layers. It has been decided, therefore, to display the picture in what has become its traditional configuration.

Acknowledgements

I would like to thank Rachel Billinge, Leverhulme Research Fellow, for her production of the infra-red reflectogram, and Dr Walter Liedtke, Curator of European paintings at the Metropolitan Museum of Art, New York, for the use of his photographs of his peepshow reconstruction. I would also like to thank Dr Liedtke and Dr Christopher Brown, Chief Curator, National Gallery, London, for their helpful discussions of the subject with me.

Notes and references

1. This was presumably done sometime before 1836, the date of the oldest inscription on the panel. The unusualness of the walnut support and the extreme crudeness of this structural treatment argue against a contemporary date for this procedure.
2. Before acquisition by the Gallery the picture is recorded as having been restored 'about 1900'.
3. The lower layer was adhered with Paraloid B-72, while the upper two facings were adhered with Paraloid B-67. The higher solubility of the latter resin would allow for the upper facings to be removed from the lower one in a controlled manner.
4. The high temperatures required in traditional animal glue applications would shorten the available working time, making it likely that the glue would have begun to set quite quickly on the panel. It is also easy to imagine that the slightly skewed placement of the canvas or the presence of foreign material between canvas and panel would have been difficult to rectify once the canvas had been stuck down.
5. For a fuller description of this type of treatment and an extensive bibliography see Paul Ackroyd, Anthony Reeve and Ann Stephenson-Wright, 'The Multi-Purpose Low Pressure Conservation Table', *National Gallery Technical Bulletin,* 12, 1988, pp. 4–16.

6. Ibid., pp. 10–15, for descriptions of other similar moisture treatments.
7. In order to achieve the melting point of Beva 371, 68°C, the table surface heaters were set at 74°C to account for heat loss through the Melinex and canvas.
8. For a summary of recent arguments see Christopher Brown, *Carel Fabritius*, Oxford 1981, pp. 123–4.
9. Walter Liedtke, '*The View in Delft* by Carel Fabritius', *The Burlington Magazine*, CXVIII, 1976, pp. 61–73.
10. See Liedtke, op. cit., p. 66, for diagrams of of similar curved mounting systems proposed by other scholars.
11. See Christopher Brown, David Bomford, Joyce Plesters and John Mills, 'Samuel van Hoogstraten: Perspective and Painting', *National Gallery Technical Bulletin*, 11, 1987, p. 75, for evidence of paper over the top of the Hoogstraten peepshow.
12. Documents listed in Brown 1981, op. cit., p. 124, as follows: *Het stuckgen van Fabritius sijnde een kasgen* from the 1661 Delft inventory of Gerrit Jansz. Treuniet, *Een casje van Fabritius* from the 1683 Leiden inventory of Aernot Eelbrecht, *Een perspectyff van Hoft van Hollandt* from the 1669 inventory of Catharina Tachoen, and *en stort optisk Stykke, stande paa et Postament gjort af en fornem meester Fabricio til Delft* from the 1690 Danish royal collection inventory. Only the Danish reference can be linked to a surviving work, which is not by Fabritius. Liedtke, op. cit., p. 65, refers to a description by John Evelyn in his diary of a perspective box with a very similar construction and subject, seen by him in 1656: '. . . was shew'd me a prety Perspective & well represented in a triangular Box, the greate Church at Harlem in Holland, to be seene thro a small hole at one of the Corners, & contrived into an hansome Cabinet. It was so rarely don, that all the Artists and Painters in Towne, came flocking to see & admire it.' For a description of the six remaining peepshows, none of which is painted on a curved surface, see S. Koslow, 'De wonderlijke Perspectyfkas', *Oud Holland*, 82, 1967, pp. 33–56.
13. See Samuel van Hoogstraten, *Inleyding tot de Hooge Schoole der Schilderkonst: anders de Zichtbaere Werelt*, Rotterdam 1678, Book 7, p. 274, and Book 8, p. 308; Arnold Houbraken, *De Groote Schouburgh der Nederlantsche Konstschilderessen*, Amsterdam 1718–21, Vol. 3, pp. 337–9. Both are reproduced and translated in Brown 1981, op. cit., pp. 160–1.
14. See Svetlana Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century*, Chicago 1983, chapter 2, for a discussion of the relationship between Dutch art and Kepler's investigation of the eye and vision.
15. For a concise summary of relevant perspective theory and history see Brown, Bomford, Plesters and Mills, op. cit., pp. 65–8. For discussion of perspective in the works of Saenredam and a comparison of Houckgeest and De Vries, see Martin Kemp, *The Science of Art: Optical Theories in Western Art from Brunelleschi to Seurat*, New Haven and London 1990, pp. 115–17. See also Alpers, op. cit., p. 58, on De Vries and multiple distance points.
16. Arthur Wheelock Jr, *Perspective, Optics, and Delft Artists Around 1650*, New York and London 1977, pp. 4–11 and 191–206.
17. Reproduced in Wheelock, op. cit., figs. 28–9.
18. Ibid., pp. 9 and 203.
19. Ibid., pp. 11 and 205.
20. For example, Brown 1981, op. cit., p. 205, on the Wheelock hypothesis: 'To the present writer the results were not compelling, and I believe that Fabritius could have painted a *View in Delft* using traditional perspective practices and empirical observation.'
21. Wheelock also objects to the change in the shape of the lute as seen in the curved configuration, claiming that it is much too thin and shallow. Photographic representation of the curved peepshow, with its fixed single view, tends to compress the anamorphic distortion of the outer sections of the image slightly more than would be experienced from the same viewing position by the scanning human eye. Additionally, there is enough diversity in seventeenth-century lute shape and size, with several quite shallow-bowled instruments by Hans Frey or Wendelin Tieffenbrucker, for example, to seriously weaken this argument. See Ernst Pohlmann, *Laute, Theorbe, Chitarrone: Die Instrumente, ihre Musik und Literatur von 1500 bis zur Gegenwart*, Bremen 1968, for lists and measurements of surviving period instruments.
22. For a full description of the National Gallery's infra-red reflectography equipment and procedures, see Rachel Billinge, John Cupitt, Nicolaos Dessipris and David Saunders, 'A Note on an Improved Procedure for the Rapid Assembly of Infrared Reflectogram Mosaics', *Studies in Conservation*, 38, 2, pp. 92–8.
23. Wheelock, op. cit., p. 200.
24. The breadth of the lute's cast shadow, however, has been reduced from its drawn shape – perhaps an example of an intuitive adjustment of a more mathematically correct but visually awkward anamorphic projection.
25. Wheelock, op. cit., p. 202.
26. For other documented examples of cusping patterns different from original painting sizes, see David Bomford, Christopher Brown and Ashok Roy, *Art in the Making: Rembrandt*, London 1988, pp. 92, 112 and 114.
27. As identified in the National Gallery Scientific Department by Jennifer Pilc and Marika Spring with FTIR and EDX techniques.