Philip Steadman

*Vermeer's Camera:
The Truth behind the Masterpieces*
(Oxford: Oxford University Press, 2001)

David Hockney

*Secret Knowledge: Rediscovering the Lost
Techniques of the Old Masters*
(London: Thames and Hudson, 2001)

Reviewed by David A. Vila Domini

Towards the end of the year 2001, the poet Tom Paulin commented on the BBC2 programme "Newsnight Review" that, for him, the cultural highlight of that year had been a visit to the Vermeer exhibition held at the National Gallery in London. I had been to see the exhibition in the summer and been struck by the exquisite delicacy of the paintings, some of which achieve their remarkably lifelike character at much smaller sizes than I had imagined. It is not just the accuracy of the volumes and the convincing rendition of the perspective, but also an ineffably realistic sense of light and shadow, reflections and transparencies, that make these works mesmeric masterpieces of introspective beauty. But the apparent oddity of choosing work already four centuries old as the highlight of the first year of a new millennium, may be partly explained by the fact that things are still being discovered about it that make it in some way new to us.

The art historical tradition has until recently offered two main practical explanations for the extraordinary development of naturalism in painting during and following the Renaissance, of which Vermeer is but one example, albeit a singularly important one. One of these explanations is the invention of the technique of scientific perspective; the other is the genius of the painter's eye which, we are told, is now fully intent on rendering detail accurately. But despite the well documented fact that some artists such as Canaletto made use of other devices, namely optical aids, when working, investigations into this sort of activity have rarely advanced very far, possibly, as Martin Kemp pointed out in his *Science of Art*, due to a feeling on the part of the critic or art historian "that it is not quite proper for their favoured artists to resort to this kind of cheating".

Philip Steadman collects in his book the results of years of investigation into Vermeer's working methods. With little regard for the reservations that some art historians may have, Steadman, an architect by training, leads us on a search for evidence to support claims that the seventeenth-century artist from Delft could have used some kind of *camera obscura* to aid him in the execution of his works. Although unable to

prove conclusively that Vermeer was in fact in possession of the kind of—at the time—advanced lens necessary to construct a fully working *camera obscura*, he is able to demonstrate with the aid of documentation that the close social circle in which Vermeer moved was in fact a source of the best of these lenses.

Having established thus the possibility of access to the necessary technology, the author constructs a carefully assembled argument based on the close observation of the interior spaces represented in the few surviving mature Vermeers. The similarity of many of these interiors has led previous scholars to argue that they correspond to a limited number of spaces in which the painter placed his models, but Steadman goes on to reconstruct each one of the spaces depicted in the paintings to show that the common underlying pattern represents a single space. This single space is the artist's studio, altered in the various paintings only in minor details such as the floor tile pattern, or the leaded window design. Steadman is able to establish the size of the room by comparison with real objects, such as surviving maps and furniture of the period which are accurately depicted in some of the paintings.

In possession of the dimensions of Vermeer's studio, Steadman explores the implications of producing the paintings in that space with the aid of a convex-lens, cubicle type, *camera obscura* located at the end of the room, as suggested by the presence of the mysterious object in the glass ball reflection in *Allegory of the Faith*. These studies are carried out with the aid of both a scale model and a full sized reconstruction of the room. Once the props and characters for each painting are set up, the remarkable observation is that the sizes of most of the extant paintings correspond to those of the images projected onto the back wall of the studio by the lens Vermeer is most likely to have used.

This argument alone does not strictly prove Vermeer's reliance on the *camera obscura*, but it does satisfy the Ockham's Razor principle of economy, and in consequence must remain the most likely scenario for the production of Vermeer's paintings. Steadman in any case buttresses this with other evidence in favour of the use of a camera, such as the out-of-focus effects discernible in the foreground basket of *The Milkmaid*, or the wide angle lens distortion evident in *Officer and Laughing Girl*. Throughout, the author reveals the results of his investigations by including comparisons of the images generated in the reconstructions with the original paintings, in order to discuss such detail as the pattern of highlights, shadows, and reflections. All these factors add up to a pretty convincing refutation of the possibility that the paintings may have been constructed using not a camera, but a geometric perspectival construction in the footsteps of Brunelleschi and Alberti.

Steadman's technique of comparing the work one is trying to give some sort of account of with the actual results of the process proposed for it, i.e., the process of testing out a hypothesis in practice, is shared with David Hockney in his *Secret Knowledge*. Here the veteran British painter starts out with a question raised by another exhibition at the National Gallery, this time one on the work of Ingres. Hockney wondered how

Ingres had achieved such fluidity of line in his pencil portraits at the same time as such accuracy. The answer lay in the use of a *camera lucida*, not really a camera at all but more like a “prism on a stick” which allows the artist to see the surface on which he is working at the same time as the real life subject he depicts. Hockney relates how he taught himself to use this instrument and presents us with the results and his experience: the technique is difficult and requires considerable practice before it is mastered.

Hockney realised that these drawings contained tell-tale signs betraying the way they had been created. For example, distortions in scale between head and body revealed the two portions had been drawn with an intervening pause. At the second sitting the relative position of all or some of the elements—paper, *camera lucida*, eye, subject—must have changed slightly, resulting in the altered proportions. Hockney then set out to look for more of this kind of evidence systematically.

In the first section of the book Hockney hardly argues, he shows; his brief, charmingly direct text accompanies a wealth of beautifully reproduced paintings and details that illustrate his discoveries. He presents us with the evidence he has uncovered by examining a large range of paintings from pre-Renaissance art to the present, copies of which were arranged in chronological order in his studio along the length of a “great wall”, with northern European paintings above, southern below. This allowed him to inspect at a glance the developments in painters’ ability to depict realistically.

What becomes immediately apparent is that, after a very slow improvement in realist effect beginning some time around Giotto, a sudden change takes place, especially in the portraiture and still life of early fifteenth century Netherlandish painting. This dramatic change art historians have claimed is the result of artists suddenly being able to draw better. Hockney does not think this is the whole story. He finds 1420s Flemish paintings so markedly different in quality and so improved in realistic effect, that he argues there must have been some change in technique, some intervention of optics that contributed in bringing the new painting about. But traditionally it is held that the type of *camera obscura* available at the time could not have produced images of sufficient clarity to aid painters, and the lenses that eventually allowed a large enough aperture for the camera had not been developed yet.

At this point Hockney introduces what is a well-established optical fact, but one which has gone unreported in art or art-historical circles: known since antiquity as a “burning mirror”, a concave mirror such as those used for shaving or make up can act as a projecting lens, given the correct lighting conditions. And curved mirrors of the right sort of size certainly existed at that time, as is evidenced in a number of the paintings that are studied, most impressively in Van Eyck’s *Arnolfini Wedding* of 1434, though in this case the mirror depicted is convex.

Working from inside a dark room with only a roughly head-sized opening onto his subject, the painter could have projected the view through that opening onto a paper or canvas by means of a concave mirror in order to trace over it. Hockney tests out the technique and finds it is a perfectly workable one, but with its own limitations: for

example, the size of the projected image would be limited by the size of the mirror to about 30 cm across. Larger paintings would have to be constructed by collaging several of these images together, with the corresponding shifts of point of view and sometimes scale. For example, in the *Arnolfini Wedding*, the extraordinarily complex chandelier which hovers above the pair, is actually seen straight on, which is evidence of it being painted independently from the rest of the painting.

As Hockney's argument unfolds, and more and more evidence of the use of optics is uncovered, new groupings of artists are suggested according to the methods they employ. Thus, the similarities between a Warhol drawing made by tracing from a slide projector image and an Ingres pencil portrait made with a *camera lucida* become apparent in the kind of line that both reveal; or perhaps more strikingly, Van Eyck's *Ghent Altarpiece* of 1432 and Hockney's own *Pearlblossom Highway*, a collage of photographs, are both large compositions corresponding to what he calls the "multi-window perspective".

The development of more powerful lenses led to a change in technique, from the concave projecting mirror, to the lens-adjusted *camera obscura*. Hockney detects such a shift in the work of Caravaggio, for example, whose early *Sick Bacchus* of 1594 shows evidence of collaging. But his later *Bacchus* of 1595-6 appears to be "seen" from a single point of view. An inevitable consequence of working with mirrors and lenses, the reversal of the image results in a large number of the characters depicted appearing to be left handed. In addition, the need to refocus the lens in order to paint areas of the painting corresponding to different spatial depth resulted in slight changes in size, or alignment, such as that apparent in the pattern of the carpet used as tablecloth in Hans Holbein's *Portrait of Georg Gisze*.

The lack of any evidence of preparatory drawings for many artists, and the absence of any kind of tracing or transfer marks in their completed paintings, appear to lend weight to the optical argument. Many works are likely to have been painted directly onto the canvas, which would have been practicable enough if tracing over a projected image with the brush. The very rapid development of some artists, such as Velazquez may also indicate that they did so with the assistance of optical devices.

In the second section of Hockney's book the reader is provided with documentary evidence on the historical existence of optics and its application in art. Some of the material here is treated in Steadman's book in a more traditionally academic fashion, but Hockney provides in addition texts relating to the concealment of this kind of knowledge. The third and last section gives transcripts of the author's correspondence with art historian Martin Kemp, optics expert Charles Falco, and others during the two years of research into the topic, and is valuable for the many ideas and observations it contains.

One of the main difficulties the author has is in explaining how it can be that, before his own discoveries, the knowledge of such optical practices was for all intents and purposes entirely lost, and it is this particular mystery that gives the book its title. Artists are naturally secretive, we are reminded, and the guild system in which they worked only

reinforced this trait. At the same time, the sheer rarity of the images projected by lenses, especially as they are moving images, would have made them mysterious phenomena easily associated with black magic and certainly forced into concealment by religious orthodoxy.

In the end, Hockney's idea that the history of art since the early Renaissance is the history of a relationship with the optical image is a simple but revolutionary one, and there is no doubt that it will be resisted by deep seated notions about the nature of that art. And one of the sticking points will be the issue of Hockney's methodology, which is quite unlike traditional art historical practices. On this point, Steadman's carefully crafted and scrupulously erudite book serves as an example of the kind of work that might be undertaken to begin to complete the details of Hockney's ambitious historical outline.

Both authors argue that the use of optical techniques does not lessen the artistry of the artist, his skill—although in my view this knowledge may call for some revision of what exactly is meant by that skill, since a greater understanding of technique ought to enable a better assessment of the process of development and innovation. Hockney insists that optics do not produce marks, the hand does, and while Steadman's text implicitly concurs, it allows itself the barest speculation on the influence of Vermeer's technique upon his art. This evidences the tension latent in Hockney's complex claim that, at the level of the individual artist, optics does not constitute art; but on a historical scale, optics is at least in part responsible for art since the Renaissance, and the hijacking of optical techniques by photography towards the end of the nineteenth century is the cause for modern art to abandon naturalism and return to non-optical imagery.

These books are symptomatic of a growing interest not just in the visual, as has been often remarked, but also in the practical process of production, in the techniques and technologies that make the work of art possible, that bring it about in matter. Their investigations into concrete details, into the traces of making left on the works, and by means of reconstructions of hypothetical processes are in this case a contribution made by those working on the fringes of the art-historical discipline: a painter attempts to answer a painter's questions in regard to image production—trade secrets—, and an architect transfers his interest in space to the spaces in which paintings are produced — the camera in the *camera*. That they have come up with closely related answers is perhaps only an indication that art history, a discipline which after all, arises from the practice of art collecting, not making, may in some ways be having to return to the workshop, at least as far as concerns obtaining its philological material.

About the Reviewer

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