Optics and the Old Masters

In his March 2004 article, David Stork purports to examine David Hockney’s and my optical evidence that the chandelier in van Eyck’s “The Arnolfini Marriage” is based on a projected image. However, rather than addressing any of our published evidence, he applies to the image a technique that is inapplicable to anything but a perfectly symmetrical object; an implausible assumption for a handmade 15th century chandelier. Stork compounds this fundamental error by basing his entire analysis on the positions of decorative features attached to the arms, the portions of the image least likely to exhibit symmetry.

Although he offers his Fig. 6 as validation of his analysis technique, this is a very deceptive figure. Large 15th century, six-arm chandeliers exist, but Stork selected a modern reproduction of a much smaller, less ornate, four-arm chandelier. Not only does the single decorative feature centered on each of its arms result in symmetry lacking from any complex chandelier, but a four-arm reproduction is also easier to construct symmetrically. Even so, the reproduction has enough imperfections to result in Stork’s lines not meeting at ideal foci in his Fig. 6, betraying the failure of his analysis when there are even minor deviations from perfect symmetry (the low camera position and small scale of Fig. 6 further confuse comparison with van Eyck’s chandelier).

In contrast to Stork’s misleading analysis, our published evidence, summarized in Fig. 1, shows that van Eyck’s chandelier indeed exhibits the perspective expected for a painting based on an optical projection.

Stork has a number of other errors of understanding. For example, since the mirror is shown in the painting, irrespective of its focal length it obviously could not have been used to project an image of itself. Stork’s contention that the projected images are too dim to use is simply wrong, and his statements about “the historical record” are also at variance with the facts.

For example, 61 treatises on optics were written between the time of al-Haytham and van Eyck, showing this 400-year period was one of remarkable activity. Although only a few of these texts have been translated into English, they describe in detail how to fabricate suitable concave mirrors from metal. One of the shorter descriptions is: “Make a spherical mirror as before [from clear iron]; smooth and polish its interior along the concave portion of its curvature…” 3

Stork’s failure to cite our published evidence for this painting is unacceptable scholarship. No less misleading is his citation of extracts printed in the popular media and on Web sites as long as four years ago, rather than the actual scientific and historical evidence for this painting that we have published and presented ourselves, of which he has been aware since at least October 2002.

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References