

THE OPTICAL CONCERNS OF JAN VAN EYCK'S PAINTING  
PRACTICE

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*“Jan van Eyck’s eye operates as a microscope and as a telescope at the same time...so that the beholder is compelled to oscillate between a position reasonably far from the picture and many positions very close to it.” (Erwin Panofsky).*

## ABSTRACT

Van Eyck's paintings tend to be described in terms, often derived from the field of optics, relating to sensations or effects of light, such as 'luminescent' or 'mirror-like'. This thesis aims to define, first, how the distinctively 'optical' characteristics of his practice operate in visual and technical terms, and second, what this suggests about van Eyck's concerns as an artist. Using evidence provided by the paintings themselves, it will argue that his interest in optical distortions and enhancements produced by optical devices – including mirrors and lenses – profoundly influenced the character of his painting practice.

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- 3.63. Jan van Eyck, detail of Rolin's brocade, *Virgin and Child with the Chancellor Nicolas Rolin*, c.1435-36, Musée du Louvre, Paris (from Dhanens, 1980).
- 3.64. Jan van Eyck, detail of van der Paele's surplice, *Virgin and Child with the Canon van der Paele*, 1434-36, Groeningemuseum, Bruges (from Dhanens, 1980).
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- 4.12. Rogier van der Weyden, *Polyptych of the Last Judgement*, exterior, c.1443-51, Musée de l'Hôtel-Dieu, Beaune (from De Vos, 1999).
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- 4.28. Jan (and Hubert?) van Eyck, detail of Jodocus Vijd's head (1:1), *Ghent Altarpiece*, exterior (completed 1432), Cathedral of Saint Bavo, Ghent (from Dierick, 1996).
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- 4.33. Jan van Eyck, detail of van der Paele's head (1:1), *Virgin and Child with the Canon van der Paele*, 1434-36, Groeningemuseum, Bruges (from Dhanens, 1980).
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- 4.38. Rogier van der Weyden, *Descent from the Cross*, c.1430-35, Museo del Prado, Madrid (from De Vos, 1999).
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- 4.45. Rogier van der Weyden, *Saint Luke Drawing the Virgin*, c.1435-36, Museum of Fine Arts, Boston (from De Vos, 1999).
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- 4.52. Jan van Eyck, detail of Rolin's gown (1.5xM), *Virgin and Child with the Chancellor Nicolas Rolin*, c.1435-36, Musée du Louvre, Paris.
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- 4.57. Jan van Eyck, detail of floor tile (1:1), *Virgin and Child with the Chancellor Nicolas Rolin*, c.1435-36, Musée du Louvre, Paris (from Comblen-Sonkes and Lorentz, 1995).

- 4.58. Rogier van der Weyden, detail of floor tile (1:1), *Saint Luke Drawing the Virgin*, c.1435-36, Museum of Fine Arts, Boston (from Eisler, 1961).
- 4.59. Rogier van der Weyden, *Portrait of a Woman*, c.1432-35, Staatliche Museen, Gemäldegalerie, Berlin (from De Vos, 1999).
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- 4.61. Jan van Eyck, detail of face (1:1), *Margaret van Eyck*, 1439, Groeningemuseum, Bruges.
- 4.62. Rogier van der Weyden, *Portrait of a Lady*, c.1463-64, National Gallery of Art, Washington D.C. (from De Vos, 1999).
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- 4.65. Robert Campin, detail of face (1:1), *Portrait of a Man*, c.1435, National Gallery, London (digital print, National Gallery, London).
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- 4.67. Jan van Eyck, detail of face (1:1), *Portrait of a Man with a Red Chaperon*, 1433, National Gallery, London (digital print, National Gallery, London).
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- 4.69. Rogier van der Weyden, detail of face (1:1), *Anthony of Burgundy*, c.1461-62, Musées Royaux des Beaux-Arts de Belgique, Brussels (from De Vos, 1999).
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- 4.71. Jan van Eyck, detail of face (2xM), *Portrait of a Man with a Red Chaperon*, 1433, National Gallery, London (digital print, National Gallery, London).
- 4.72. Jan van Eyck, detail of hand (2xM), *Jan de Leeuw*, 1436, Kunsthistorisches Museum, Vienna (from Dhanens, 1980).
- 4.73. Jan van Eyck, detail of a hand (2xM), *Tymotheos*, 1432, National Gallery, London (digital print, National Gallery, London).
- 4.74. Rogier van der Weyden, detail of hands (2xM), *Portrait of a Woman*, c.1432-35, Staatliche Museen Gemäldegalerie, Berlin (from De Vos, 1999).



- 4.75. Rogier van der Weyden, detail of drapery (1:1), *Bladelin Altarpiece*, c.1445-48, Staatliche Museen Gemäldegalerie, Berlin (from De Vos, 1999).
- 4.76. Rogier van der Weyden, detail of Marriage scene (1:1), *Seven Sacraments Altarpiece*, c.1440-45, Koninklijk Museum voor Schone Kunsten, Antwerp (from Campbell, 2004).
- 4.77. Rogier van der Weyden, detail of landscape (1.4xM), *Saint Catherine in a Landscape*, c.1430-32, Kunsthistorisches Museum, Vienna (from De Vos, 1999).
- 4.78. Jan van Eyck, detail of background landscape (1.4xM), *Saint Francis Receiving the Stigmata*, 1430s, Galleria Sabauda, Turin (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.79. Jan van Eyck, detail of statue in a niche, *Virgin in a Church*, c.1426-28, Staatliche Museen, Gemäldegalerie, Berlin (from Dhanens, 1980).
- 4.80. Jan van Eyck, detail of the Virgin's throne (1:1), *Dresden Triptych*, 1437, Gemäldegalerie Alte Meister, Dresden (from Dhanens, 1980).
- 4.81. Jan van Eyck, detail of the Virgin's throne (2xM), *Dresden Triptych*, 1437, Gemäldegalerie Alte Meister, Dresden (from Dhanens, 1980).
- 4.82. Rogier van der Weyden, detail of the Virgin's throne (1:1), *Virgin and Child in a Niche*, c.1430-32, Kunsthistorisches Museum, Vienna (from De Vos, 1999).
- 4.83. Rogier van der Weyden, detail of sculpture, *Virgin and Child Enthroned in a Niche*, c.1425-30, Thyssen-Bornemisza Collection, Madrid (from Hand, Metzger and Spronk, 2006).
- 4.84. Jan van Eyck, detail of the Virgin's hair (2xM), *Virgin in a Church*, c.1426-28, Staatliche Museen, Gemäldegalerie, Berlin (from Dhanens, 1980).
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- 4.88. Jan van Eyck, *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
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- 4.90. Jan van Eyck, detail of distant figures (1.7xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.91. Jan van Eyck, detail of figures on the path (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.92. Jan van Eyck, detail of Saint Francis's feet (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.93. Jan van Eyck, detail of Saint Francis's hands (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.94. Jan van Eyck, detail of Brother Leo's head and right hand (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.95. Jan van Eyck, detail of Brother Leo's foot (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.96. Jan van Eyck, detail of Saint Francis's head (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.97. Jan van Eyck, detail of wildflowers (2xM), *Saint Francis Receiving the Stigmata* (1:1), 1430s, John G. Johnson Collection, Philadelphia Museum of Art (from van Asperen de Boer, Spantigati and Butler et al, 1997).
- 4.98. Rogier van der Weyden, *Saint George and the Dragon* (1:1), c.1425-30, National Gallery of Art, Washington D.C. (from De Vos, 1999).
- 4.99. Rogier van der Weyden, detail of figures walking along a path, *Saint George and the Dragon* (1:1), c.1425-30, National Gallery of Art, Washington D.C. (from De Vos, 1999).
- 4.100. Rogier van der Weyden, detail of landscape with figures on horseback, *Saint George and the Dragon* (1:1), c.1425-30, National Gallery of Art, Washington D.C. (from De Vos, 1999).
- 4.101. Limbourg Brothers, detail of figures in August miniature (2xM), 1411/12-16, *Très Riches Heures du Duc de Berry*, Musée Condé, Chantilly, ms. 65, fol. 8v. (from Dufournet, 1995).

- 4.102. Jacquemart de Hesdin, detail of Flight into Egypt (1.2xM), c.1403, *Très Belles Heures de Notre-Dame*, Bibliothèque Royale de Belgique, Brussels, ms. 11060-61, fol. 106r. (from Taburet-Delahaye and Avril, 2004).
- 4.103. Boucicaut Master, detail of Saint Victor of Marseille (2xM), c.1412-13, *Châteauroux Breviary*, Bibliothèque Municipale, ms. 2, fol. 237r. (from Villela-Petit, 2003).
- 4.104. Rogier van der Weyden, detail of Saint Catherine's dress (2xM), *Saint Catherine in a Landscape*, c.1430-32, Kunsthistorisches Museum, Vienna (from De Vos, 1999).
- 4.105. Jan van Eyck, detail from Birth of John the Baptist (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.106. Jan van Eyck, detail from Birth of John the Baptist (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.107. Jan van Eyck, detail from Birth of John the Baptist (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.108. Jan van Eyck, detail from Baptism of Christ (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v., bas-de-page (from Boespflug and König, 1998).
- 4.109. Jan van Eyck, detail from Baptism of Christ (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v., bas-de-page (from Boespflug and König, 1998).
- 4.110. Jan van Eyck, detail from Birth of John the Baptist (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.111. Jan van Eyck, detail from Birth of John the Baptist (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.112. Jan van Eyck, detail from Birth of John the Baptist (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v. (from Boespflug and König, 1998).
- 4.113. Jan van Eyck, detail from Baptism of Christ (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v., bas-de-page (from Boespflug and König, 1998).

- 4.114. Jan van Eyck, detail from Baptism of Christ (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 93v., bas-de-page (from Boespflug and König, 1998).
- 4.115. Jan van Eyck, detail from Funeral Mass (1:1), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 116r. (from Boespflug and König, 1998).
- 4.116. Jan van Eyck, detail from Funeral Mass (2xM), c.1422-25, *Turin-Milan Hours*, Museo Civico d'Arte Antica, Turin, (Milan) fol. 116r. (from Boespflug and König, 1998).

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## **INTRODUCTION**

The Introduction will first outline the aims and limits of the thesis in the context of relevant scholarly literature. As the general bibliography on van Eyck is so extensive, I will only discuss more specialised studies directly related to the optical aspects of his practice. The second part of the Introduction will provide a concise outline of the uses and properties of optical devices available in the 1420s and 1430s.

### 0.1. The Tradition of Optical Description

Throughout their history, van Eyck's paintings have been described using a vocabulary derived from the field of optics. Many of the earliest commentators were apparently as impressed with their mirror-like naturalism and their remarkable descriptions of light as viewers are today. As early as 1559, for example, the poet and painter Lucas d'Heere composed an *Ode* in praise of the "Adoration of the Lamb" on the occasion of the twenty-third chapter of the Order of the Golden Fleece (23-25 July, 1559) in which he compared the panels of the *Ghent Altarpiece* with mirror images, exclaiming, "Tsijn Spieghels, en gheen gheschilderde tafereelen...".<sup>1</sup> Other early commentators noted how accurately van Eyck's paintings transcribe optical effects. Bartolomeo Fazio, for example, saw van Eyck's lost *Woman Bathing*, and was particularly impressed with its descriptions of light, including a lantern and a ray of sun which appeared like real sunlight. He was, however, apparently most impressed with a mirror in the painting, stating, "sed nihil prope admirabilius in eodem opere quam speculum in eadem tabula depictum, in quo quaecunque inibi descripta sunt, tanquam in uero speculo prospicias".<sup>2</sup>

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<sup>1</sup> "These are mirrors and not painted panels...". d'Heere's volume of poems entitled *Den Hof en Boomgaard der Poësiën* is preserved in a single manuscript in the University of Ghent Library. The text, as cited here, is reproduced in Weale, 1908: lxxvii-lxxxii.

<sup>2</sup> Fazio, *De viris Illustribus*: 102-03 (hereafter cited as *De viris*). "...but almost nothing is more wonderful in this work than the mirror painted in the picture, in which you see whatever is represented as in a real mirror".

The historiographic tradition of emphasising the optical character of van Eyck's works is likewise prevalent in modern scholarship. In an attempt to define what makes van Eyck's paintings so unique in their naturalistic character and their precious, jewel-like surfaces, scholars have continued to employ suggestive, often metaphorical, optical terms. Johan Huizinga's classic text, *The Autumn of the Middle Ages*, for example, was originally entitled *In the Mirror of van Eyck*, and the phrase "microscopic-telescopic", famously used by Panofsky<sup>3</sup> (but actually coined by Arthur Pope in 1931),<sup>4</sup> has provided generations of scholars with an analogy that is both accurate and suggestive. To this day, most descriptions of van Eyck's paintings use terms such as 'mirror-like'<sup>5</sup>, 'light-filled'<sup>6</sup>, 'glowing',<sup>7</sup> or 'crystal-clear'<sup>8</sup> to describe their style and technique, their pristine paint surface, or the experience of viewing glazed layers of oil paint.

With only a few exceptions, however, these descriptions of van Eyck's paintings are more suggestive than specific. Indeed, such terms have almost become established scholarly metaphors for Eyckian paintings, referring in particular to their pristine, glossy surfaces, their luminous oil glazes, or their apparently microscopic descriptions of detail. In most cases, there is also an underlying connotation that van Eyck, on some level, intended his work to be seen and experienced in such optically charged terms. Rarely, however, is the basis for this connotation explored or even directly addressed.

Given that van Eyck's paintings are so frequently described in such optical

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<sup>3</sup> Panofsky, 1953: 182.

<sup>4</sup> Pope, 1931: 100ff.

<sup>5</sup> Hamburger, 2000b: 396.

<sup>6</sup> Harbison, 1993: 163.

<sup>7</sup> Pächt, 1999: 15, who also notes a comparison between van Eyck's paintings and refraction in precious gemstones.

<sup>8</sup> Harbison, 1991: 14.



terms, it is surprising that no study has sought to define their optical character more accurately or more fully. Instead, scholarship has focused primarily on specific, but limited, aspects of this issue – most notably numerous iconographic studies of depicted objects, such as the Arnolfini mirror, technical studies of van Eyck's use of oil glazes, and investigations into the growth of naturalistic painting generally in the this period (primarily in relation to various cultural and social 'contexts').

This thesis aims to define more precisely what characterises the distinctive 'optical' character of van Eyck's paintings. In referring to their 'optical' character, I am not, therefore, simply concerned with how they describe and use light in a broad sense, but with the specific idea that their character is in some way defined by a conscious concern with the properties of optical images. Using a synthetic approach to visual analysis, it will look primarily at inter-related issues of style and technique, although it will also address how these concerns relate to the operation of symbolism. The body of the thesis argues that van Eyck's work was informed specifically by his interest in how images produced by optical devices – such as mirrors and lenses – alter the usual relationships between light, vision and painting. In doing so, the thesis aims to outline an important new context for the study of Eyckian painting generally.

### **0.1.1. Van Eyck's 'art et science' and the Formation of the Legend**

Although little is known about van Eyck's training and educational background, a long-standing belief that the distinctive character of his paintings derives from a secret aspect of his education, materials, or technique has informed, directly and indirectly, scholarly studies related to this issue. In particular, two related legends about van Eyck – that he invented oil painting and that he was a man of learning – are still at the root of many attempts to explain why his paintings appear so exceptionally different from most other paintings in their use of glazed paint, their

approach to naturalism and in their descriptions of light. Vasari's well-known story (1550)<sup>9</sup> that van Eyck invented oil painting whilst looking for a quick-drying varnish was disproved in 1774.<sup>10</sup> However, the belief that van Eyck must have used a special technique, involving multiple layers of glazed paint, to achieve his optically-brilliant colours has persisted in a diluted form in modern scholarship.<sup>11</sup> Whilst those concerned with the techniques and materials of Netherlandish panel paintings have sought to emphasise how *unremarkable* van Eyck's technique actually was, many art historians have advanced a contradictory myth that it was in some way exceptional.

The second, related legend about van Eyck – that he was a man of learning – has likewise facilitated the idea that he may have been a technical innovator, or even an alchemist, with an exceptional knowledge of science and geometry.<sup>12</sup> This legend is also rooted in early written references to van Eyck's character which are either ambiguous in their meaning or simply unreliable as biographical sources. The earliest, most significant reference is Bartolomeo Fazio's account of van Eyck in *De viris illustribus* (1456), which states that "literarum nonnihil doctus, geometriae praesertim et earum artium quae ad picturae ornamentum accederent, putaturque ob eam rem multa de colorum proprietatibus inuenisse, quae ab antiquis tradita ex plinii et aliorum auctorum lectione didicerat".<sup>13</sup> Fazio's comments, however, seem to derive primarily from his own interest in evaluating artists according to humanistic discourses, especially their relationship with painters of antiquity,<sup>14</sup> and cannot be considered

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<sup>9</sup> Vasari, *Le Vite*, 1: 184-7 and 2: 565-66.

<sup>10</sup> For the historiographic development of the Vasari legend, see Brinkman, 1993, who cites Gotthold Ephraim Lessing as the first writer to challenge the myth in *Vom Alter der Ölmalerey aus dem Theophilus Presbyter*, 1774.

<sup>11</sup> Roy, 2000 describes these as subsidiary myths which grew from the central myth.

<sup>12</sup> Most notably, Panofsky, 1953: 180.

<sup>13</sup> Fazio, *De viris*: 102-03. "He was not unlettered, particularly in geometry and such arts as contribute to the enrichment of painting, and he is thought for this reason to have discovered many things about the properties of colours recorded by the ancients and learned by him from reading of Pliny and other authors".

<sup>14</sup> See Baxandall, 1971: 98-111, who shows that Fazio's text was itself based on classical literary

reliable evidence of van Eyck's character.

The second frequently-cited reference to van Eyck's learned character comes from a more reliable witness. In 1435, Philip the Good wrote a letter to his accounting office at Lille, ordering that outstanding pension payments be made immediately to his "varlet de chambre et peintre, Jehan van Eyck". The duke explained that it was important that van Eyck should not have cause to leave his service because "nous le voulons entretenir pour certains grans ouvraiges, en quoy l'entendons occuper cy après et que nous ne trouverions point le pareil à nostre gré ne si excellent en son art et science".<sup>15</sup> Exactly what the duke meant in referring to van Eyck's accomplishment in "art and science" has long been a matter of conjecture for art historians. To some, the phrase provides support to Fazio's suggestion that van Eyck was not only a skilled artist but also probably well read, intellectually curious, and proficient in geometry.<sup>16</sup> As Catherine Reynolds has pointed out, however, the words 'science' and 'art' were often used, in similar contexts, either interchangeably, or in combination as reinforcing synonyms.<sup>17</sup> The duke's words cannot therefore be taken as evidence for van Eyck's knowledge of 'science' in the modern sense of the word.

## **0.2. Scholarly Literature and the Persistence of Eyckian Legends**

Although most scholars are well-aware of the unreliable and tenuous nature of these early written references to van Eyck, studies which have sought most directly to describe the optical character of van Eyck's practice have tended to do so in reference

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sources. Hall, 1994: 125 and 167 n.62 suggests that Fazio derived his characterisation of van Eyck from Pliny's description of Pamphilus.

<sup>15</sup> "...we wish to keep him [in our service] for certain important works on which we intend to employ him hereafter, and because we could find no other artist to our liking who is so accomplished in his art and science." Weale, 1908: doc.24, xlii-xliii.

<sup>16</sup> Panofsky, 1953: 179-80.

<sup>17</sup> Reynolds, 2000: 2-3.

to these two well-established legends – that van Eyck was a scholarly artist who derived his knowledge of geometry and colours from texts such as Pliny or that he was a technical innovator who used a ‘secret’ technique.

### 0.2.1. Colour, Geometry and the ‘Paragone’: The Textual Explanation

One of the few studies to have looked specifically at the optical concerns of van Eyck’s paintings is Rudolf Preimesberger’s analysis of van Eyck’s Thyssen-Bornemisza *Annunciation* (Fig 3.77), ‘Zu Jan van Eycks Diptychon der Sammlung Thyssen-Bornemisza’,<sup>18</sup> which leans very heavily on the legend that van Eyck’s approach to describing optical effects was in some way derived from a theoretical knowledge of optics and (mostly antique) written sources. Building on Fazio’s characterisation of van Eyck, Preimesberger identifies details in van Eyck’s paintings which, he argues, reflect specific passages from Pliny. In particular, Preimesberger finds textual sources for some of the specific reflective objects van Eyck describes in his paintings. He suggests, for example, that the black, mirror-like material behind the figures in the *Annunciation* panel might allude to passages from Pliny’s *Naturalis Historia* about Apelles (his dark varnish or ‘atramentum’, for example), and that the reflection of the painter in St George’s shield in the *Virgin and Child with the Canon van der Paele* (Figs. 1.4 and 1.28) might refer to the account in Plutarch’s *Pericles* that Phidias represented himself with Pericles on the shield of Athena Parthenos. Preimesberger’s central argument, however, is that reflective surfaces and mirrors are used in van Eyck’s paintings in reference to the idea of the *paragone* (the competition between painting and sculpture discussed in Italy from c.1400). By allowing van Eyck to show objects from the sides and from the back, his use of reflective surfaces such as the one in the *Annunciation*, and mirrors such as the one in the lost *Woman Bathing*

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<sup>18</sup> Preimesberger, 1991.

described by Fazio, Preimesberger argues, may have been intended to demonstrate how the painter could compete with, or outdo, sculpture.

Preimesberger's analysis is framed around a detailed visual analysis of the *Annunciation* diptych, which, he suggests, supports the idea that van Eyck had a good understanding of basic optical principles such as reflection. He points out, for example, that the reflections behind the sculpted figures are (correctly) slightly smaller than the figures themselves,<sup>19</sup> and that cast shadows inside the repeating trefoils on the pedestals are not just slightly longer on the left side but also slightly lighter, as they are further from the implied light source at the upper right.<sup>20</sup> He also notes that these principles had been demonstrated in Perspectivist texts by Roger Bacon, John Pecham and Witelo<sup>21</sup> (although he stops short of arguing that van Eyck had actually read these texts). He goes on to suggest that correspondences between reflections, shadows and perspective are so accurately described that one can determine the angle at which the hinged panels were intended to be positioned (with the right panel showing Mary angled inward slightly to the left panel, he argues).

Preimesberger's argument that van Eyck's painting demonstrates a sophisticated knowledge of basic optical principles is convincing. It also seems plausible that van Eyck was familiar with stories from Pliny and perhaps also the contemporary Italian debate about the *paragone*, although the visual evidence does not seem sufficient to support either of these suggestions beyond speculation. Preimesberger does not, however, consider the possibility that van Eyck's interest and knowledge of optics and the visual possibilities of reflection was empirically based, deriving from observational skills rather than passages in antique texts or debates about the limits of painting. Furthermore, the unique optical character of van Eyck's

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<sup>19</sup> Preimesberger, 1991: 477.

<sup>20</sup> Preimesberger, 1991: 480.

<sup>21</sup> Preimesberger, 1991: 475-78.

work, as I will demonstrate, derives less from an exceptional knowledge of optical theory than from the uniquely sophisticated ways in which his paintings transcribe and replicate aspects of optical experience visually and pictorially. In this respect, Preimesberger's analysis is limited in its preoccupation with the textual origins of van Eyck's concern with optics.

Although my approach takes a different view of the origin and nature of van Eyck's understanding of optics, it is not incompatible with Preimesberger's suggestion that van Eyck was also familiar with certain textual ideas about antique images of reflection or debates prevalent in contemporary Italian texts. In contrast to Preimesberger, however, this thesis concentrates primarily on the more practical experience van Eyck might have gained from experimenting with lenses and mirrors and how this interest was translated into his painting practice. This, as I will demonstrate, provides a more direct and more compelling approach to the optical character of van Eyck's work.

### **0.2.2. Translucency, Luminence, and the Problem of van Eyck's 'Secret' Technique: The Technical Explanation**

In recent years, technical investigations of van Eyck's paintings have put to rest the idea that he used a special technique or different materials from his contemporaries. In fact, since the 1950s technical research has increasingly emphasised how 'unremarkable' van Eyck's paintings are from a technical viewpoint. Whereas those investigating van Eyck's technique in the nineteenth and early twentieth centuries – such as Mérimée,<sup>22</sup> Berger<sup>23</sup> and, later, Doerner<sup>24</sup> – sought to uncover the presumed complex glazing technique van Eyck used to impart a glowing

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<sup>22</sup> Mérimée, 1830 and the English translation, 1839.

<sup>23</sup> Berger, 1897.

<sup>24</sup> Doerner, 1933, and the English translation, 1984.

brilliance to his panels, the trend has now reversed, and researchers are now undoing erroneous ideas about van Eyck's 'secret technique' – advanced by earlier works such as Doerner's – which, they argue, represent modern variants of the 'Vasari legend'.<sup>25</sup>

Since Coremans' groundbreaking report on the *Ghent Altarpiece* in 1953,<sup>26</sup> the key myths about van Eyck's technique – that he used a secret paint medium, and that he used multiple superimposed layers of glazed paint – have been comprehensively demolished in the technical literature. It is now widely accepted that van Eyck's binding media were quite typical for the period, consisting primarily of a drying oil, and that his paintings only use three or four layers of paint, not a complex multi-layered system of glazes.<sup>27</sup> Following Coremans, the *Ghent Altarpiece* was subject to further study between 1978 and 1988, when the paint samples taken in the 1950s were re-analysed using new analytical techniques (also, the underdrawings were analysed in 1979 using infra-red reflectography).<sup>28</sup> These studies, published by Kockaert and Verrier (1978/79)<sup>29</sup> and Pim Brinkman (1984-85,<sup>30</sup> 1988-89<sup>31</sup> and 1993<sup>32</sup>), have confirmed the basic findings of the Coremans report (although they also identified evidence of a protein binder used for blues, additives of resin used in certain glazes, and several pigments – including verdigris and 'copper resinate', previously thought

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<sup>25</sup> See, for example, White, 2000: 101. Notably, the study by Eastlake, 1847 was based on a more comprehensive range of examples and textual sources than earlier studies had identified. His discussion of van Eyck is, however, framed around Vasari's account, and his comments are, of course, based primarily on empirical observations and textual sources.

<sup>26</sup> Coremans, 1953.

<sup>27</sup> Although these findings are not always reflected outside specialised technical literature. Gage, 1993: 131, for example, states "What van Eyck brought to the technique was essentially a complicated method of glazing transparent colours over a light ground...". Such misleading comments are not uncommon in even recent art-historical literature.

<sup>28</sup> van Asperen de Boer, 1979.

<sup>29</sup> Kockaert and Verrier, 1978/79.

<sup>30</sup> Brinkman, Kockaert, Maes, Masschelein-Kleiner, Robaszynski and Thielen, 1984-85.

<sup>31</sup> Brinkman, Kockaert, Thielen and Wouters, 1988-89.

<sup>32</sup> Brinkman, 1993.

to be malachite – which Coremans was unable to identify precisely in 1953). Since the 1990s, studies on the *Ghent Altarpiece* have been supplemented with new evidence from Eyckian paintings which had previously not been examined, including the Washington *Annunciation*,<sup>33</sup> the Thyssen-Bornemisza *Annunciation*,<sup>34</sup> the two paintings of *St Francis Receiving the Stigmata*<sup>35</sup> and the Bucharest *Portrait of a Man with a Ring*.<sup>36</sup> These studies have stressed consistencies in the materials and techniques used in each of these paintings, identifying technical skill as the only significant difference between van Eyck's paintings and paintings by other artists.

Technical reports on paintings by earlier and contemporary painters – in particular, the Antwerp-Baltimore panels and 'Campin Group' works – have also provided an invaluable body of comparative material.<sup>37</sup> (Information on the pigments used by Robert Campin has only been available as recently as 1996).<sup>38</sup> Significantly, works associated with Campin and van der Weyden are now considered more likely candidates for complex mixed-media techniques than works associated with van Eyck.<sup>39</sup>

There is, however, less clarity in the collective evidence about van Eyck's technique than technical researchers have suggested. Whereas studies by Brinkman and others on the *Ghent Altarpiece* have found evidence of three different binding media, studies of other paintings, such as the *Arnolfini Double Portrait* have vehemently suggested that van Eyck used only one.<sup>40</sup> Likewise, whereas Brinkman

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<sup>33</sup> Gifford, 1995b, and Gifford, 1999.

<sup>34</sup> Bosshard, 1992.

<sup>35</sup> van Asperen de Boer, Spantigati and Butler, 1997, van Asperen de Boer, 1997 and Butler, 1997.

<sup>36</sup> van Asperen de Boer, Ridderbos and Zeldenrust, 1991.

<sup>37</sup> Especially Gifford, 1995a, van Asperen de Boer, 1996, Villers, 1996, Bomford, Campbell, Roy and White, 1996, Garido, 1996, White, 1996, Campbell, 1997 and Campbell, Bomford, Roy and White, 1994.

<sup>38</sup> van Asperen de Boer, 1996.

<sup>39</sup> White, 2000: 103 who describes the use of egg tempera with oil.

<sup>40</sup> White, 2000: 104.



suggested that (crushed) ‘copper resinate’ was used on the *Ghent Altarpiece* (on John the Baptist’s drapery for example),<sup>41</sup> the comparable green of Mrs Arnolfini’s dress, according to the London researchers, is not a ‘copper resinate’ complex, but verdigris bound in linseed oil with a minor addition of pine resin.<sup>42</sup> The reality is that as different methods of analysis have been employed at different times, the data is often difficult to compare conclusively. It is also problematic that our knowledge of van Eyck’s technique is based so heavily on evidence from the *Ghent Altarpiece* (which may have been started by Hubert van Eyck) since different materials and techniques might have been used in later works, or works produced for a different purpose. There is, however, a broad consensus that the materials and the layer structure van Eyck used consistently were apparently typical for their time. It is also a standard practice of almost all recent technical studies of Eyckian paintings to conclude with the truism that van Eyck’s ‘secret’ was not a matter of the materials he used, but a question of how he used them.

In recent years, inter-disciplinary studies of early Netherlandish paintings – such as the one by Melanie Gifford and Carol Purtle on the evolution of the iconography in van Eyck’s *Washington Annunciation*<sup>43</sup> – have promoted dialogue about how such specialised technical evidence might inform wider contextual, ‘art-historical’ issues and, conversely, how art-historical questions might guide technical research beyond the traditional concern with “methods and materials”.<sup>44</sup> One particular area which has received very little attention in an inter-disciplinary context, however, is the relationship between van Eyck’s style – which has traditionally been

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<sup>41</sup> Brinkman, 1993, and Brinkman, Kockaert, Thielen and Wouters, 1988-89: 29-33.

<sup>42</sup> White, 2000: 104, and Campbell, 1997: 53.

<sup>43</sup> Gifford, 2000 and Purtle, 2000. Also, it is becoming increasingly common to publish art-historical and technical literature together. See, for example, Foister, Jones and Cool, 2000, Foister and Nash, 1996 and Hand, Metzger and Spronk, 2006.

<sup>44</sup> For a discussion of the value of technical studies, see especially Faries, 1998 and Ainsworth, 1998.

an art-historical issue – and his technique – which has been studied most thoroughly by research conservators. As stylistic analysis is no longer a fashionable art-historical method, the ‘mystery’ of van Eyck’s technique has, in recent years, been addressed most fully in technical literature.<sup>45</sup> Significantly, these studies have stressed how unremarkable was van Eyck’s technique for its time, indicating (somewhat ironically) that his secret was not ‘technical’ but rather ‘stylistic’. Raymond White’s brief conclusion to his (mostly technical) account of the ‘van Eyck myth’ is typical of this tendency:

In conclusion we may well ask: ‘wherein lies the secret of the van Eycks’ novelty and brilliance?’ I would suggest that it does not lie in any secret, ‘magic’ nostrum, nor in the development of any complex, paint vehicle system. Rather the genius lies in the acute power of observation of the subtle nuances and interplay of light, shade and tone...<sup>46</sup>

As my thesis aims to demonstrate, Raymond White’s statement is, I believe, correct, but these issues themselves are deserving of more detailed analysis than scholarship has so far given to them. Furthermore, I would argue that many of the characteristics that make van Eyck’s paintings so optically distinctive are either issues of technique which are rarely addressed (such as paint handling), or inter-related issues of style and technique (such as his approach to painting fine detail). The discussion simply needs to extend not just beyond the limits of old ideas about van Eyck’s ‘secret technique’ but also beyond the perceived limits of related disciplines. This thesis will emphasise, in particular, the inter-related aspects of van Eyck’s style and technique which have not been addressed fully by either art historians or technical

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<sup>45</sup> See, for example, Roy, 2000 and White, 2000.

<sup>46</sup> White, 2000: 104.

specialists.

### **0.2.3. Stylistic, Visual and Iconographic Approaches to the Optical Character of Eyckian Painting**

Further studies, beyond those framed around the legends about van Eyck's learning and technique, have also examined the optical character of Eyckian paintings using both formal and iconographic approaches. The majority of these have been concerned with the iconographic significance of particular objects, especially the Arnolfini mirror. In recent years, it has been suggested, on the basis of visual evidence, that van Eyck may have used an optical device as a practical aid to painting or drawing.

#### *Optical Iconography*

Depicted objects such as mirrors, lenses, carafes filled with water and shiny metallic objects contribute significantly to the distinctive optical character of van Eyck's paintings. Since the 1930s, these objects have been read primarily according to the iconographic method.<sup>47</sup> Most notable among these is Millard Meiss's landmark study, 'Light as Form and Symbol in Some Fifteenth-Century Paintings'<sup>48</sup> in which he argues that the topos of light passing through glass was a familiar symbolic reference to Christ's Incarnation in late medieval devotional literature, and that Flemish painters from early in the fifteenth century alluded to this symbol visually in their work by showing light passing through glass objects such as carafes and windows. (I will discuss this symbolic tradition in detail in Chapter I).

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<sup>47</sup> In particular, de Tolnay, 1932, Panofsky, 1934, de Tolnay, 1939. Following Panofsky, 1953 the iconographic method dominated scholarship into the 1980s.

<sup>48</sup> Meiss, 1945.

Following Meiss, a number of studies have looked at specific glass and metallic objects in van Eyck's paintings. Brian Madigan,<sup>49</sup> for example, has looked at the glass carafes of water in the Ghent Altarpiece *Annunciation*, the *Lucca Madonna* and the *Ince Hall Madonna*,<sup>50</sup> and David Carter<sup>51</sup> and David Farmer<sup>52</sup> have looked at the reflective, mirror-like armour worn by St. George in the van der Paele panel. Whilst these short studies have contributed to our understanding of the symbolic potential of particular objects within certain (primarily religious) contexts,<sup>53</sup> they do not comment on how reflective and refractive objects collectively contribute to the character of van Eyck's paintings, either symbolically or visually.

The overwhelming majority of studies which have considered the significance of optical effects in van Eyck's paintings have been concerned primarily with the (symbolic) significance of the convex mirror in the *Arnolfini Double Portrait* (Figs 0.3 and 1.3) within the context of the apparently complex iconography of the painting. Robert Baldwin's article 'Marriage as a Sacramental Reflection of the Passion', most notably, attempts to identify the "central symbolic function and religious meaning of the mirror".<sup>54</sup> Baldwin examines various late medieval symbolic meanings associated with the mirror – including the mirror as a topos of the human soul which mirrors the *Imago Dei* – before going on to develop the idea, first suggested in 1950 by Hans Kauffmann,<sup>55</sup> that the mirror refers not only to the human soul but also to Christ's Passion, and that in reflecting the wedded couple, the mirror "makes explicit the

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<sup>49</sup> Madigan, 1986.

<sup>50</sup> The *Ince Hall Madonna* is now generally thought to be the work of a follower.

<sup>51</sup> Carter, 1954.

<sup>52</sup> Farmer, 1968.

<sup>53</sup> Significantly, the suggestion made by Preimesberger 1991: 483-85, (mentioned above) that van Eyck's reflected image is a play on the Middle Dutch word *schild* (meaning shield and painting), offers an alternative, non-religious symbolic reading of this motif which tends to be favoured in more recent literature.

<sup>54</sup> Baldwin, 1984: 57.

<sup>55</sup> Kauffman, 1950.

common link between Christ's sacrifice and the sacraments, in particular Marriage".<sup>56</sup>

Yvonne Yiu's more recent study of the Arnolfini painting, *Jan van Eyck. Das Arnolfini-Doppelbildnis: Reflexionen über die Malerei*,<sup>57</sup> includes a chapter in which the mirror is analysed within various symbolic contexts and also in relation to the visual concerns of the painting. Yiu outlines and develops the established symbolic ideas associated with the mirror, including its function as a kind of witness, as a reference to seeing (either as the eye of God or the eye of the artist), and also its association with the Passion, which she notes was established in earlier mirror-shaped tondo panels that often represent Christ's Passion in the form of a *Pietà*, such as the one attributed to Jean Malouel c.1400.<sup>58</sup> However, Yiu's study also develops in more detail Hans Belting's idea<sup>59</sup> that the painting itself might be understood as a symbolic mirror. As a miniature version of the painting, she argues, the depicted mirror serves to reinforce conceptual relationships between the painting, the painter, seeing, and the viewer. She goes on to suggest that this thematic preoccupation with seeing and self-referentiality is a dominant feature of other paintings by van Eyck, which include reflected images of the painter (in the van der Paele panel) or 'internal viewers' (in the Rolin panel). Although much of Yiu's analysis is based on theoretical ideas which were not demonstrably familiar to viewers in the fifteenth century,<sup>60</sup> it succeeds in demonstrating how the mirror operates in visual terms in relation to, and also aside from, the iconography of the painting. Her analysis of how the mirror functions to enhance and verify the 'reality effect' of the painting is particularly convincing in the

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<sup>56</sup> Baldwin, 1984: 57.

<sup>57</sup> Yiu, 2001.

<sup>58</sup> This was first argued by Belting and Kruse, 1994: 78-79.

<sup>59</sup> Belting and Kruse, 1994, who discuss the idea of the panel as a mirror in the context of a wider argument about the invention and development of the *Gemälde*.

<sup>60</sup> For example, self-referential ideas associated with the practice of mimetic painting, many of which derive from the study by Stoichita, 1997.

context of van Eyck's obvious fascination with using optical effects to naturalistic ends.

My study is not concerned primarily with the various symbolic meanings associated with particular objects depicted in van Eyck's paintings. As the value of Panofsky's iconographic method has been (overly-) criticised in recent years, however, the first chapter of this thesis will assess the value and limitations of this method in the context of van Eyck's use of 'optical symbolism'. As so much has already been written on the Arnolfini mirror, this chapter will consider an object which has received little scholarly attention – the pair of spectacles depicted in the *Virgin and Child with the Canon van der Paele*. The remainder of the thesis, however, takes a different approach, based on visual analysis, offering both new readings of the paintings and also a new way of looking at them. This emphasis is intended to complement existing iconographic and iconological readings, which prioritise the role of optical symbolism.

### *Optical Devices*

Unsubstantiated, 'passing' suggestions that van Eyck might have used mirrors and lenses as a practical aid are relatively common in the literature. Elisabeth Dhanens, for example, suggested that van Eyck might have painted the *Arnolfini Double Portrait* by "turning his back on the space he wanted to show and looking at it in a convex mirror".<sup>61</sup> Similarly, Craig Harbison observed that convex pilgrims' mirrors had the effect of drastically condensing space, and that "van Eyck's desire to depict a Gothic cathedral on a foot-high panel could have been stimulated by such mirrors".<sup>62</sup> No study, however, has addressed the validity of such suggestions directly.

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<sup>61</sup> Dhanens, 1980: 204.

<sup>62</sup> Harbison, 1993: 163.

Modern references to van Eyck's supposed use of these devices appear to derive from Heinrich Schwarz's 1959 article, 'The Mirror of the Artist and the Mirror of the Devout',<sup>63</sup> which argues that northern European painters used circular convex mirrors as an aid to painting. He argues that paintings associated with the workshop of Konrad Witz such as the Naples Holy Family panel c.1440-45 (Fig 2.3) demonstrate visual distortions which "may be due to the use by the artist of a convex mirror".<sup>64</sup> He implies that the painter may have arrived at this distinctive approach to space in an attempt to replicate the character of paintings by van Eyck, including the Berlin *Virgin in a Church* (Fig 1.11) and the Washington *Annunciation* (Fig 3.100), which he argues have a similar 'eccentric perspective'.<sup>65</sup> Schwarz goes on to suggest that the mirrors frequently found in Netherlandish paintings, and especially in the work of Campin and van Eyck, are further evidence that artists used mirrors as an aid to painting. The second part of his essay looks at the small convex mirrors made by Johannes Gutenberg from the 1430s and used by pilgrims at Aachen and Nuremberg to capture and take home the rays emanating from the relics.

Schwarz's essay, significantly, does not analyse in any detail the spatial distortions he observes in the paintings by the Witz painter or van Eyck. (Surprisingly, the article does not even include an image of a convex mirror reflection for comparison). Nor does he explain how artists might practically have used the mirrors, or whether only certain artists (associated with van Eyck and Witz perhaps?), or all artists at this time used mirrors in the same way.

As more recent authors have pointed out, Schwarz's suggestion that depicted mirrors in paintings provide evidence of their use in workshops of the time is not so

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<sup>63</sup> Schwarz, 1959.

<sup>64</sup> Schwarz, 1959: 93.

<sup>65</sup> Schwarz, 1959: 104.

straightforward. As examples often (though not always) occur in images of St. Luke painting the Virgin, it is quite possible that the mirrors have a symbolic function in relation to the Virgin or the saint. A recent study by Yvonne Yiu, 'Der Spiegel: Werkzeug des Künstlers oder Metapher der Malerei? Zur Deutung des Spiegels in Produktionsszenarien in der nordischen Malerei des 15. und frühen 16. Jahrhunderts',<sup>66</sup> has also suggested that the mirrors depicted in images of St. Luke may be metaphorical references to painting. (She argues that images of St. Luke painting the Virgin show a reflected image of the painter, whereas images of the saint *drawing* do not include the mirror at all).

The studies by Schwarz and Yiu are concerned with the use of convex mirrors by artists throughout the fifteenth century (primarily the period 1470-1520). Neither author, however, suggests that different artists may have used mirrors in different ways, with different visual concerns. In contrast, my thesis is concerned more specifically with the nature of van Eyck's interest in these devices, in the context of his wider interest in optics.

Following Schwarz, the artist David Hockney (in collaboration with the scientist Charles Falco) is the most recent author to have suggested a relationship between van Eyck's painting practice and optics. In his book, *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters*,<sup>67</sup> Hockney suggests that painters from van Eyck to Ingres used optical instruments to project and trace images. His argument in many ways repeats (often without due credit) existing scholarship on the use of the camera obscura and the camera lucida by artists such as Vermeer.<sup>68</sup> Hockney, however, suggests that such equipment was used much earlier (the 1420s) than authors had previously suggested. A key part of his argument for this early

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<sup>66</sup> Yiu, 2005.

<sup>67</sup> Hockney, 2001.

<sup>68</sup> For example, Alpers, 1983, Fink, 1971, Hyatt Mayor, 1946, Mills, 1998 and Schwarz, 1966.



period is based on his own practical experiments with a concave mirror, which he uses to demonstrate how real images can be projected onto a panel and traced. He argues that this technology was available to artists such as van Eyck from the 1420s, and that the use of a 'mirror-lens' accounts for the "greater naturalism...(which) occurred suddenly in the 1420s or early 1430s in Flanders".<sup>69</sup>

It is not possible or necessary to outline the range of problems with Hockney's thesis here, as these have already received ample attention elsewhere. In particular, the interdisciplinary conference held in Ghent in 2003, 'Optics, Optical Instruments and Painting: The Hockney-Falco Thesis Revisited', included a series of papers which were critical of Hockney's idea that artists during the fifteenth century projected and traced images.<sup>70</sup> These papers primarily questioned whether artists had the knowledge and/or equipment to project images before the late sixteenth century. Others questioned the inconclusive or inaccurate visual evidence and the lack of any written documents in support of the theory. The special issue of *Early Science and Medicine: Optics, Instruments and Painting, 1420-1720: Reflections on the Hockney-Falco Thesis*<sup>71</sup> also concluded that whilst the idea that seventeenth-century artists used optical instruments to aid painting has been known for a long time, there is "little evidence" that earlier artists used the same process of optical projection. Several websites continue to discuss various aspects of Hockney's theory,<sup>72</sup> but, as Martin Kemp has noted, the debate has largely degenerated into increasingly "personalised polemic" and the defence of "predetermined stances" using selective technical evidence.<sup>73</sup> As a

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<sup>69</sup> Hockney, 2001: 71.

<sup>70</sup> The conference consisted of 24 invited participants from different disciplines. Abstracts of the papers can be downloaded at <http://sarton.ugent.be/agenda/documents/Report.pdf>. The collection of articles in Dupré, 2005 are also based on the papers given at this conference.

<sup>71</sup> Dupré, 2005.

<sup>72</sup> In particular, Charles Falco's website, <http://www.optics.arizona.edu/ssd/FAQ.html>, and David Stork's website, <http://www.diatrope.com/stork/FAQs.html>.

<sup>73</sup> Crimsini, Kemp and Kang, 2004: 110.

whole, the debate surrounding Hockney's thesis has neglected to take sufficient account not only of the diverse cultural circumstances of the different painters he discusses, but also of the known evidence of their working practices.<sup>74</sup>

It is not my intention to enter the somewhat narrow debate surrounding the validity of Hockney's speculative and problematic theory. I should also like to clarify that my own study takes a very different view to the one suggested by the 'Hockney-Falco thesis'. I do, however, believe that Hockney is right to point out that paintings during the 1420s, even allowing for the vast numbers of works which have not survived, develop a naturalistic character which might be described as an 'optical look'. I also agree that aspects of this optical character are related to a developing interest in mirrors and lenses. Beyond this observation, however, I find Hockney's theory that mirrors and lenses were used by Campin and van Eyck to project images unconvincing. In fact, most of the qualities that suggest the optical character of paintings by van Eyck – glazed layering of paint, descriptions of shadows, saturated colours, sharp edges and outlines, strong tonal contrast, fine detail – are not properties typical of projected images, which are invariably dim, and only selectively sharp. Furthermore, Hockney takes little account of what is already known of van Eyck's working process. As van Eyck's paintings were composite images, the practice of positioning a reversed, projected image of each object to the correct scale, directly onto the panel, would have been a clumsy, somewhat impractical, and ultimately unnecessary method of drawing. Also, this method would have been ill-suited to the slow process of building up the layers of opaque and transparent paint, which are primarily responsible for the 'optical look' Hockney (rather vaguely) perceives.

In contrast to Hockney, who uses carefully selected examples of work by various artists to support his predetermined theory, this study uses detailed visual and

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<sup>74</sup> Yiu, 2005 is one of few exceptions to this tendency.

technical analyses of van Eyck's paintings, and the methods used to create them, as a starting point for inquiry. Whereas the debate surrounding the 'Hockney-Falco thesis' has focused almost entirely on how artists might literally have used mirrors and lenses as a means of projecting images, my own theory is concerned with how van Eyck's paintings were informed by a much wider variety of experiences and experiments with mirrors and lenses, the effects they produce, and the ways in which they might have changed how van Eyck saw and represented the visual world. In this respect, I would argue that his interest in optics and optical devices was actually far more profound than the concerns of the 'Hockney-Falco thesis' allow.

Although Hockney's ideas have offered little new or convincing evidence about the relationship between artists and optics, the increased publicity around this subject has produced a handful of more rigorous and scholarly studies. Of these, the most relevant study to this thesis is Crimsini, Kemp and Kang's article, 'Reflections of Reality in Jan van Eyck and Robert Campin',<sup>75</sup> which uses mathematical techniques drawn from 'computer vision' to assess the accuracy of the painted mirror images in the *Arnolfini Double Portrait* and the Campin Group *Saint John the Baptist and the Franciscan Master of Arts, Heinrich von Werl* (1438) (Fig 0.1). Using algorithms and a series of hypotheses about the radius and convexity of the mirrors, the study "rectifies" the distortions caused by the convex mirrors in order to measure the accuracy of the depicted reflections. The study finds that that the accuracy of the Werl panel reflection is greater than the one in the Arnolfini panel, but that both are rendered with sufficient accuracy to indicate that both artists had observed real mirror images of interiors with configurations of objects and figures exactly as they appear in the paintings. Although the authors are primarily concerned with demonstrating the value of computer vision techniques, the study also reveals some of the limitations of

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<sup>75</sup> Crimsini, Kemp and Kang, 2004.

this approach. Above all, it should be acknowledged that no algorithms are able to reproduce the (often dramatic) alterations that real convex mirror images display when the viewing angle, or the angle of the mirror, is altered just very slightly. Also, the authors fail to mention that the optical principles against which the depicted mirror images are being tested are not met by the paintings themselves, which also contain a number of optical 'distortions' in their approach to space. Any departures from what is optically plausible within the depicted mirror images must surely be considered in the context of similar departures in the depicted space. (I discuss these optical distortions in detail in Chapter II). The conclusion of their study also goes against the known body of evidence that demonstrates van Eyck's depicted spaces were not copied directly from real ones, but composed of composite parts of observed buildings and structures. The authors of the study do not address how their own evidence relates to this aspect of van Eyck's practice.

What the Crimsini, Kemp and Kang study shows quite persuasively, however, is that van Eyck and a Campin Group painter were able to reproduce painted reflections with such accuracy that they must have understood very well the optical properties of convex mirrors. The fact that the scenes these painted mirrors reflect are more likely to have been fictional, composite spaces actually reinforces how apparently remarkable was their understanding of optical principles such as reflection.

My approach to how van Eyck's paintings were informed by the use of convex mirrors follows a suggestion made by David Carleton<sup>76</sup> that van Eyck's paintings use a kind of "elliptical perspective" which betrays the characteristics of a convex mirror. Carleton's suggestion is based on mathematical perspective analyses of van Eyck's paintings which, he argues, employ two vanishing points to construct spatial settings

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<sup>76</sup> Carleton, 1982.

with the characteristics of a convex mirror. A counter-argument by Ward (1983)<sup>77</sup> has highlighted a number of problems with Carleton's thesis, including methodological issues (about how Carleton identified orthogonals and vanishing points) and evidence that van Eyck may not have used any kind of mathematical system at all. Although Ward's criticisms are in many respects convincing, aspects of Carleton's argument are, in my opinion, valid, and, in particular, his initial observation that the spatial character of van Eyck's paintings resembles a convex mirror reflection is deserving of further investigation. In Chapter II, I will assess Carleton's thesis and Ward's counter-argument, in addition to providing an alternative argument to those offered by Carleton and Ward. Whereas both authors have been primarily concerned with evidence based on perspective analyses, my approach uses visual comparisons between convex mirror reflections and details from van Eyck's paintings to allow for the possibility that his construction of space was primarily empirical, rather than mathematical. Furthermore, my assessment of van Eyck's use of convex mirrors is not simply based on spatial evidence, but considered in the context of all stylistic and technical aspects of his paintings (Chapters III and IV).

### **0.3. Visual and Stylistic Approaches and the Methodology of the Thesis**

My own approach perhaps most closely follows the example of art historians such as Otto Pächt, Lawrence Gowing, and Michael Baxandall, whose writings have demonstrated most convincingly that close visual analysis of works can provide a persuasive foundation for new ways of understanding them. Most importantly, Otto Pächt's *Van Eyck and the Founders of Early Netherlandish Painting*<sup>78</sup> (based on lectures given in Vienna 1965-66 and 1972, and first published in German in 1989),

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<sup>77</sup> Ward, 1983.

<sup>78</sup> Pächt, 1999.

not only provides an exemplary model of analysis, but also includes a number of observations about the optical character of Eyckian paintings which are developed more fully in this thesis. Pächt's study is concerned with the broader principles upon which the *Ars Nova* developed, and although he does not discuss the potential role of mirrors and lenses, his study includes significant observations about the role of light and perception in van Eyck's paintings. Pächt suggests, for example, that the *Ghent Altarpiece* was designed to be seen from multiple viewpoints, deriving from a new 'viewer-oriented' emphasis characteristic of Eyckian painting.<sup>79</sup> My own discussion of van Eyck's approach to detail and scale derives in part from this observation. Pächt also argues that space is often described primarily as a recreation of optical experience in van Eyck's paintings, as opposed to an exercise in perspective construction. He suggests that the *Rolin Madonna* was constructed around the experience of looking from the half-light of an interior into the sunshine.<sup>80</sup> This observation also provided a starting point for my own analysis of van Eyck's use of light in Chapter III. It is testament to Pächt's ability to identify the essence of a painting's character that such relatively brief discussions have provided the impetus for many of the ideas in this thesis. (Other examples will be referred to in the footnotes). My own approach differs from Pächt's, however, in its use of technical evidence, which he was on occasion not afraid to contradict.<sup>81</sup> Whilst I agree with Pächt's view that technical studies require a degree of subjective interpretation, my own approach seeks to integrate technical evidence with visual evidence, as opposed to using arguments based on style to devalue or discredit those based on science.

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<sup>79</sup> Pächt, 1999: 26.

<sup>80</sup> Pächt, 1999: 85.

<sup>81</sup> Most notably, he disagreed with Coremans' findings regarding the crown at the feet of God on the *Ghent Altarpiece*, believing "...the authors of the report have succumbed to the temptation of presenting the view most congenial to the technical experts as if it were the only one. In such cases, the stylistic critic begs to differ". Pächt, 1999: 121 (based on his 1972 lectures).

My thesis uses a more synthetic approach to visual analysis than previous studies such as the one by Pächt were concerned, or able, to provide. Although Chapter I is concerned primarily with the iconographic and iconological meanings of optical objects and effects within the images, the discussion is also placed in the context of the artistic and material concerns of the paintings. The remainder of the thesis focuses specifically on the visual concerns of the paintings themselves, both in terms of style and technique.

I am aware that my emphasis on visual analysis may initially seem reminiscent of now unfashionable formalist approaches – employed, for example, in early scholarly studies by Waagen,<sup>82</sup> Dvořák,<sup>83</sup> and later by Friedlander,<sup>84</sup> and then Pächt<sup>85</sup> – which rely heavily on the value of stylistic analysis. My own approach, however, differs significantly from these earlier studies in several key respects: first, my thesis employs a far more synthetic approach to visual analysis, using a balanced combination of stylistic, technical and, to a certain extent, iconographic evidence. In addition to examining the works in person, part of this balance involves the application of high-quality images (such as micrographs and macrographs) which often allow different kinds of evidence (technical and stylistic) to be assessed simultaneously. Also, my own experience as a practising painter informs my interpretation of more subjective aspects of scientific data. Finally, my study is concerned specifically with visual evidence strictly concerning the optical character of van Eyck's style and technique in relation to the properties of images produced by optical devices, whereas earlier studies were concerned primarily with establishing Jan's oeuvre against that of other painters (especially Hubert van Eyck).

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<sup>82</sup> Waagen, 1822.

<sup>83</sup> Dvořák, 1925 (first published in 1904).

<sup>84</sup> Friedländer, 1924-37, and the English translation, 1967-76.

<sup>85</sup> Pächt, 1999.

#### 0.4. Outline of the Thesis

The primary intention of this thesis is to define how the optical concerns of van Eyck's paintings relate to his interest in the visual properties of images produced, enhanced, or distorted by optical devices such as mirrors and lenses. It will argue that the distinctive 'optical naturalism' of his paintings is not strictly an issue of technique or style, but a matter of how these two inter-dependent aspects of painting were informed by his unique sensitivity to the visual properties of light, which itself, I suggest, derived from his experience with optical devices.

Chapter I considers the symbolic capacity of specular (glass and metallic) objects in van Eyck's paintings. It uses a case study of the pair of spectacles Canon van der Paele holds in the *Virgin and Child with the Canon van der Paele* (1434-1436) as a means of assessing the value and problems associated with a symbolic interpretation of these objects. The chapter considers how symbolic and 'non-symbolic' ideas associated with spectacles relate to the visual concerns of the painting. The analysis looks in particular at how specular objects and the optical effects they produce are used allusively in van Eyck's Marian works in reference to established specular metaphors relating to the Virgin.

Chapter II analyses how the treatment of space in van Eyck's paintings may have been informed by his interest in spatial distortions and 'enhancements' of convex mirror images. It considers in detail the treatment of space in two of van Eyck's paintings: the *Virgin and Child with the Chancellor Nicholas Rolin* and the *Washington Annunciation*. Particular attention is given to how the construction of pictorial space in these works departs from a mathematical approach, and how such departures relate to the distinctive spatial properties of convex mirror reflections.

Chapter III looks directly at the optical character of van Eyck's style and



technique. Using a combination of visual and technical evidence, it seeks to define how his paintings differ from those of other artists in their pictorial and material treatment of light. Particular attention is given to the role of transparency in van Eyck's paintings, especially their use of glazed paint. The first section considers the function of translucency in pre-Eyckian oil paintings. The second section examines how van Eyck found a new application for variably translucent paint to describe, and even generate, effects of luminance. It examines the idea that this 'optical mode' of naturalism derives from a heightened awareness of how our perceptual system processes luminance in real visual experience. This aspect of his work is compared with similar properties in convex mirror reflections.

Chapter IV examines the relationship between detail, scale, image resolution and viewing distance and how van Eyck's paintings often alter the expected relationships between these factors. Whilst art historians continually describe the detail of van Eyck's paintings in terms like 'microscopic', certain technical reports have stressed that his paintings are actually less detailed than one might expect. The chapter seeks, in particular, to define exactly how detailed van Eyck's paintings are, and how they generate an illusion of 'infinite detail'. It will also consider, within this context, the possibility that van Eyck's smaller paintings were produced with the aid of a magnifying lens.

The body of the thesis is primarily concerned with detailed visual analyses. Comments regarding the significance of these analyses in relation to wider contextual issues will be made in the Conclusion.

### **0.5. Properties and Uses of 'Optical Devices'**

The term 'optical devices' is used throughout the thesis to refer to mirrors and lenses comparable with those depicted in van Eyck's paintings. The argument central

to this thesis is that van Eyck's paintings were informed by his experience with such devices. It is therefore necessary to clarify, at this point, exactly how these devices could be used, and what their optical and visual properties were.

### 0.5.1. Mirrors

Although mirrors of polished metal (usually steel or metal alloys) had been in continuous use since antiquity, the large convex glass mirrors which van Eyck and his contemporaries were interested in, were apparently a much more recent development. Whilst small, inexpensive glass mirrors (for grooming) had been in widespread use since at least the thirteenth century,<sup>86</sup> larger, more expensive, wall mirrors – often with decorative frames – only appear to have been available from the fourteenth century.<sup>87</sup> Indeed, among the earliest images of wall mirrors are the ones depicted in the *Arnolfini Double Portrait* (1434) (Figs 0.3 and 1.3) and Petrus Christus's *A Goldsmith in his Shop (Saint Eligius?)* (1449) (Fig 0.2), which clearly show them being used as display items<sup>88</sup> – one in a goldsmith's or jeweller's shop,<sup>89</sup> the other in a particularly elaborate frame on the wall of a bourgeois interior. (In Bruges, the mirror-makers – who belonged to the same guild as the panel painters – were even permitted to decorate their frames with paintings).<sup>90</sup>

The mirror in the *Arnolfini Double Portrait* (Fig 0.3) is generally thought to be a convex glass mirror with an exceptionally large diameter of around 25-30cm (based on the relative size of other objects in the room).<sup>91</sup> Although no mirrors of this same

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<sup>86</sup> The most detailed account of medieval glass mirrors is Krueger, 1990, who provides documentary and archaeological evidence for the continuous use of glass mirrors from this time.

<sup>87</sup> See Krueger, 1990 and Hartlaub, 1951: 42-43.

<sup>88</sup> Thornton, 1997: 167-74 discusses the display of mirrors in the Italian *Sala* and *Studiolo*. I am not aware of any study that has looked specifically at the display of mirrors in northern Europe at this time.

<sup>89</sup> It is not clear if the mirror is for sale in this example, or being used to reflect the contents of the shop. van der Velden, 1998: 260-61 suggests the man may be a jeweller rather than a goldsmith.

<sup>90</sup> Lawsuit of 1450. van de Castele, 1886: 40-43, cited by Campbell, 1998: 189.

<sup>91</sup> Campbell, 1998: 189 estimates the size at 28cm.

design survive, comparable surviving mirror frames and fragments suggest that it was probably based on a real mirror (presumably belonging to Arnolfini). A number of fifteenth-century Italian bone or ivory mirror frames survive, such as the one now at the Walters Art Gallery, Baltimore (Fig 0.4), which are octagonal, and carved with religious images (usually angels).<sup>92</sup> Closer in appearance to Arnolfini's mirror, however, are a wooden, decorated mirror frame from Lübeck (fourteenth century) (Fig 0.5) and a mirror fragment from Pilsen (fourteenth century) (Fig 0.6).<sup>93</sup> These are among the largest wall mirrors to have been found, with frame diameters of 21cm and 21.7cm, the larger glass diameter (Lübeck) measuring around 14cm. Whilst these are slightly earlier in date and certainly not as luxurious as the Arnolfini mirror, they suggest that van Eyck may have exaggerated the size of the mirror in the painting slightly.<sup>94</sup>

Glass mirrors at this time were invariably convex, as they were cut from segments of blown glass globes (usually less than 0.5mm thick) which were 'silvered' on the back.<sup>95</sup> Convex mirrors, therefore, produced a distinctive wide-angle reflection, which distorted, but also enhanced the ordinary view of the visible world, allowing the viewer to see much more at a glance than would otherwise have been possible. These spatial effects are clearly visible in a number of paintings from the period, including those mentioned above (Figs 0.1, 0.2 and 0.3), which demonstrate an obvious interest in the visual possibilities of these mirrors. Unfortunately, complete convex mirrors from this period do not survive, not only because they are fragile, but

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<sup>92</sup> There are similar examples in the Museo Horne, Florence (see Rossi, 1967: 158), and in the Kunstgewerbemuseum, Berlin (see Krueger, 1990: 277).

<sup>93</sup> For these, see Krueger, 1990: 292-305. See also three sixteenth-century wall mirrors comparable to the Arnolfini mirror in Hartlaub, 1951: 42 and Figs. 28, 29 and 30.

<sup>94</sup> Campbell, 1998: 189 also suggests van Eyck exaggerated the size of the mirror. Also, the underdrawing shows an even larger octagonal frame, which was replaced at a later stage by the ten-sided frame in the final version. For the infrared reflectogram image, see Campbell, 1998: 177 and for a more detailed discussion, Billinge and Campbell, 1995: 47-60.

<sup>95</sup> For an account of the process of making a medieval mirror, backed with an alloy of tin and lead, see Kock and Sode, 2002.

primarily because the mirror glass corrodes and is either re-silvered or, more usually replaced. Surviving examples therefore usually have more recent replacement glass or, occasionally, only a very corroded fragment of original glass.<sup>96</sup> Using a modern convex mirror, however, it is possible to replicate most of the visual characteristics of the reflections depicted in the paintings.

### *Visual Properties of Convex Mirrors*

Most obviously, the reflected image in all convex mirrors curves edges that are usually seen as straight, and distorts the expected shapes and angles of familiar objects. The experience of looking into a convex mirror, however, would primarily have been one of enhancement rather than distortion. The most distinctive characteristic of convex mirror images – their wide-angle field of view – is particularly dramatic in large interior spaces. The example shown in Fig 0.7 (on the Millennium Clock in the National Museum of Scotland) shows particularly well how most of this enormous space can be seen at a glance on the surface of a small convex mirror. Likewise, in smaller spaces, a convex mirror will reflect a wider angle of view than the unaided eye is able to see without moving (as in the Arnolfini mirror for example).

The brightness of medieval mirrors is unfortunately a more conjectural matter. Since the mid-nineteenth century, mirrors have been produced using a silver backing which reflects between 90% and 99% of light, producing a reflection almost as bright as ordinary vision.<sup>97</sup> Prior to this date, mirrors were backed (or ‘silvered’) with either lead, or alloys such as lead and tin, which must have produced reflections of variable brightness and quality. Certainly, earlier and cheaper glass mirrors, such as those

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<sup>96</sup> Krueger, 1990: 233-34 discusses these problems.

<sup>97</sup> Schweig, 1973: 23-25.

made in large numbers for export<sup>98</sup> in Germany throughout the fourteenth century – probably made with brown-green forest glass and backed with lead – must have produced quite dim images by today’s standards. However, from as early as 1312, there is evidence that mirror-makers were using combinations of mercury and tin,<sup>99</sup> perhaps for larger or more expensive mirrors, which produced a brighter reflection. On the mirror from Pilsen, for example, a layer of tin or a tin alloy is still visible, although severely corroded. It is also apparent that better-quality clear glass was being used by the German mirror-makers certainly by 1420, when a man named Vincenzo Redor, who had come from Germany, is mentioned in the Venetian archives as the “inventor fondator di specchi cristallini”.<sup>100</sup>

Unfortunately, surviving fragments of original mirror glass from the fifteenth century are too corroded to give an accurate idea of how bright mirror reflections were. A method similar to the medieval mirror-making process is, however, still practised in Gujarat, western India.<sup>101</sup> Like medieval mirrors, the Indian mirrors are produced from spheres of blown glass, backed with a mixture of lead and tin.<sup>102</sup> Fig 0.8 shows a line of coloured pencils reflected in a modern mirror (square), and in a fragment of the Indian mirror-glass (circular). By sight, the Indian mirror-glass appears around 60% as bright as the modern mirror and has a slight bluish tint. Mid-tones are most noticeably darker, but there is little visible difference in the lightest highlights and darkest shadows. Consequently, the brightest highlights can appear slightly brighter, by contrast, in the Indian mirrors than they appear in reality. The

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<sup>98</sup> Both complete mirrors and also mirror glass were exported to Spain c.1425-80, for example, and to Venice before 1446. Krueger, 1990: 245-46.

<sup>99</sup> An invoice from Abbéville, listing the components of a mirror, includes a pound of mercury. See Krueger, 1990: 248-49 for a discussion of this.

<sup>100</sup> “...inventor and maker of crystal glass mirrors.” Thornton, 1997: 235. See also Hartlaub, 1951: 43.

<sup>101</sup> See Kock and Sode, 2002.

<sup>102</sup> They are not sold as convex mirrors, but broken into small pieces in the factory and used in embroideries. Kock and Sode, 2002: 84.

Indian mirror also has small imperfections where the lead coating is uneven, and there are air bubbles in the glass. These imperfections are likely to have affected medieval mirrors as well, although in larger mirrors these would be less distracting to the overall reflected image.<sup>103</sup> The best evidence for the quality of medieval mirrors is, however, provided by examples in paintings from this period. Convex mirrors depicted in paintings such as the *Arnolfini Double Portrait* (Figs 0.3 and 1.3) quite clearly show that mirrors were available which produced relatively bright, sharp reflections. There is, in my opinion, no reason to suppose that van Eyck painted the mirror reflection any less accurately than other surfaces in the painting.

It is important to point out, above all, that brightness is also a relative concept. A mirror that reflects around 60% of light placed in a dark corner of a room may appear brighter than a mirror that reflects 99% of light placed against a more brightly-lit wall. A common feature of all convex mirrors is that indoors, they tend to appear brighter than surrounding objects and surfaces. Fig 0.9 shows a modern convex mirror in a room lit by two windows on an overcast day. The mirror reflects a wide field of view, including brighter parts of the room (especially the window and objects nearby the window). As the perceptual system perceives brightness comparatively, the reflection (and therefore the mirror itself) seems much brighter than the darker walls around it.

In addition to an overall appearance of brightness, convex mirror images also appear to enhance the contrast between different surfaces in circumstances where there are large differences in visible brightness (or 'luminance'), such as a dark room with a bright window. (This is not easily visible in photographs, so it is necessary to describe the effect). Again, this effect is related to how we perceive brightness comparatively. In ordinary vision, our perceptual system regulates image brightness

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<sup>103</sup> It is also likely that more expensive mirrors would have been produced from selected segments of glass which had fewer imperfections.

by making continual adjustments to the light allowed to enter the eye. Looking from a dark room toward a bright window would cause our eyes to adjust to the increase in brightness, minimising our awareness of the difference between changing light levels. This adjustment operates according to the perceived brightness of the entire image field. If the same room is reflected in a convex mirror, much more of the visual field will be visible simultaneously, allowing both bright and dark parts of the room to be seen with less adjustment to differences in brightness. Consequently, the contrast between light and dark can appear stronger in parts of the image corresponding with the same surfaces in reality, and bright parts of the image appear brighter in contrast to the apparently darker surfaces around them.

Most importantly, by looking at these reflected images, the viewer is necessarily invited to think about the limits and properties of vision itself. The wide-angle character of the reflected image provides a contrast to the usual restricted field of view, and invites questions about how we perceive space. (Why do straight edges never appear to be curved? Do we see straight edges as straight because we know them to be so, or because they actually appear this way to the eye? How do we judge distance and scale?). Likewise, the ways in which the reflected image appears to change the relative brightness and contrast of surfaces invites questions about how we normally perceive and use this information in normal visual experience. (Why do we sometimes perceive cast shadows and sometimes not? How do we know the difference between a brightly-lit surface and a lightly-coloured surface?)

Many of these issues are also fundamental to the construction of pictorial space. By altering or enhancing the usual relationships between space, light, image and perception, the mirror provides a valuable and instructive aid to the pictorial properties of light. The optical character of van Eyck's paintings, as this thesis will demonstrate, is largely defined by a unique preoccupation with manipulating these

same relationships.

### 0.5.2. Lenses

The second important 'optical device' of concern to this thesis is the magnifying lens, which was both widely available and widely used in the 1430s. Although spectacles were invented c.1285,<sup>104</sup> there appears to have been a significant increase in their usage around the last quarter of the fourteenth century, when inexpensive spectacles (made with bone, leather or wood frames) became widely available.<sup>105</sup> At least one of van Eyck's patrons – Canon van der Paele – probably relied on these devices, as he is pictured with them in the painting finished in 1436.

Consisting of a pair of frames (usually held together by a central rivet) and either plano-convex or bi-convex lenses,<sup>106</sup> spectacles were either held directly up to the eyes, clipped onto the bridge of the nose, or sometimes held directly over the object (usually text). By closing up the frames and bringing the two lenses together, riveted spectacles also made quite powerful magnifying glasses.<sup>107</sup> Fig 0.10 shows a pair of spectacles from c.1440, probably made on the Continent, found in excavations at Trig Lane, London in 1974.

As spectacles only contained convex lenses at this time (the earliest documentary reference to concave lenses is 1462),<sup>108</sup> they were used specifically for close work, especially by those, such as scribes and scholars, who spent prolonged periods reading or writing. It has also been shown that some craftsmen, such as

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<sup>104</sup> The definitive articles on the invention of spectacles are Rosen, 1956a and Rosen 1956b. See also Ilardi, 1976, Ilardi, 1993, and, on the construction and use of spectacles, Rhodes, 1982.

<sup>105</sup> Earlier spectacles appear to have been made with precious metal frames. Rhodes, 1982, 64, and Ilardi, 1976: 514. In a period of three months from July to September 1384, 1151 pairs were imported on apparently Netherlandish ships through the port of London. Dreyfus, 1994: 305.

<sup>106</sup> Rhodes, 1982, 61.

<sup>107</sup> Rhodes, 1982, 61-62.

<sup>108</sup> A letter sent October 1462 by Francesco Sforza to his ambassador in Florence, requesting 36 pairs of spectacles, including 12 pairs for short-sightedness. See Ilardi, 1976: 345.



goldsmiths, used spectacles for fine or close work, although pictorial evidence dates mostly from the latter half of the fifteenth century.<sup>109</sup> In 1451, for example, master woodworker Arduino da Baese wrote to Cosimo de' Medici asking him for a replacement pair of spectacles for close work (wooden inlay).<sup>110</sup> Scholars have also suggested that advances in the accuracy of cutting types and justifying matrices for printing in the 1470s result, in part, from the application of lenses by the craftsmen who cut the punches.<sup>111</sup> An early pictorial example is a miniature of *Mercury and His Children* from the *Medieval Housebook* (produced c.1475-85 in the middle Rhine region) (Fig 0.11), which shows a goldsmith wearing a pair of spectacles whilst making a beaker.<sup>112</sup> Although much later, a particularly instructive visual example is the self-portrait of the renowned miniaturist Simon Bening (1558) (Fig 0.12) showing the artist at his easel, holding up a pair of spectacles which he has apparently been using to work on a miniature of the Virgin and Child.<sup>113</sup>

As Millard Meiss pointed out, just as some illuminators must have used spectacles to produce fine and detailed miniatures, so their patrons must likewise have appreciated their work with the aid of these devices.<sup>114</sup> Certainly, a number of wealthy patrons from this period, including Charles V of France,<sup>115</sup> have spectacles listed in their inventories. Philip the Bold also appears to have used spectacles from the age of 26, and in 1403 had a silver plate made to hold them, apparently inside one of his books.<sup>116</sup> (Some owners apparently kept their spectacles in a hollowed-out recession

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<sup>109</sup> Worthen, 2006: 91-93, and Thornton, 1997: 141-42.

<sup>110</sup> Ilardi, 1976: 350, n.21.

<sup>111</sup> Dreyfus, 1994: 308, and Carter, 1969: 54.

<sup>112</sup> For *The Housebook*, see Waldburg-Wolfegg, 1997.

<sup>113</sup> For the portrait see Kren and McKendrick, 2003: 485-86.

<sup>114</sup> Meiss, 1967: 5. Longnon, Cazelles and Meiss, 1989: 27 also suggest that the Limbourgs may have used lenses.

<sup>115</sup> Labarte, 1879: 219.

<sup>116</sup> For the silver plate, see Peignot, 1841: 32, and De Winter, 1982: 813. Earlier, on 14 August 1389, payment was made on behalf of Philip the Bold to Jehan de Baugis of Paris for a case to hold his

in the binding, as some surviving examples clearly show).<sup>117</sup>

The 'optical devices' pictured in van Eyck's paintings would therefore have been familiar, although probably not commonplace, objects to many early viewers. It is also likely that at least some of these viewers, such as Canon van der Paele, used their spectacles to look at his paintings.

The concern of this thesis, however, is not with the various ways in which artists and patrons in this period used mirrors and lenses, but specifically with how these devices informed van Eyck's practice, and how these concerns might be recovered using internal evidence provided by the paintings themselves. In particular, it will look at how van Eyck's paintings refer to optical concepts – such as magnification, the reflection and refraction of light, and the restrictions and limits of ordinary visual experience (in perceiving detail for example) – in primarily visual terms. Chapters II, III and IV will argue that van Eyck used both convex mirrors and magnifying lenses, not as a necessary 'aid' to painting, but as a means of pursuing deeper, conceptual and visual goals.

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spectacles. Laborde, 1851, 2: 507 (3240). Philip the Good's Inventory of 1420 includes a case for a pair (or pairs) of silver-framed spectacles, inscribed with the motto 'Y me tarde' (I am waiting). Presumably this was originally made for Philip the Bold, who used this motto from around 1380. Laborde, 1851, 2: 265 (4247).

<sup>117</sup> See, for example, De Hamel, 1986: 193.

## **CHAPTER I**

### **OPTICAL SYMBOLS AND THE LIMITS OF THE ICONOGRAPHIC METHOD: A CASE STUDY OF CANON VAN DER PAELE'S SPECTACLES**

## 1.1. Introduction: Specular Objects in Eyckian Paintings

The optical character of van Eyck's paintings is defined, at its most basic level, by numerous descriptions of glass and metallic objects and the ways in which they refract, reflect and transmit light. In the *Lucca Madonna* (c.1434-37) (Fig 1.1), for example, objects – including the gold lions on the throne, the glass carafe half-filled with water, a brass basin and candlestick, gold threads in the brocade and gemstones in the Virgin's tiara and dress – are all described according to how they respond to light from the window. The crystal carafe, perhaps most notably, (Fig 1.2) describes the passage of light through glass, from the specular reflection of the window on its facing surface, to the diffused light (transmitted through the water) on the opposite surface of the glass, producing a 'focal spot' and cast shadow on the wall behind. Such light effects, furthermore, are not simply applied to isolated objects, but part of a remarkably comprehensive and consistent attention to how light is continually reflected, re-reflected and obstructed by different surfaces. Consequently, the room appears relatively dark, the light passing through the bull's-eye glass appears bright, and objects in the room appear to respond to pictorial daylight, as though they are actually illuminated by real light. Light is not simply a pictorial device, but a central component in how the painting was constructed and how it is read.

Objects such as the crystal carafe and the brass candlestick are so carefully articulated according to their response to a specified source of light that several authors have described them as 'still-life' studies, subject to Jan's "stilled gaze".<sup>1</sup> The impression that these objects have been carefully placed, however, is also suggestive of a degree of selection and thought, implying significance beyond a purely descriptive function. In the *Arnolfini Double Portrait* (1434) (Fig 1.3), most

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<sup>1</sup> Pächt, 1999: 24.

famously, objects appear to have been distributed purposefully and prominently around the room. According to one recent interpretation, “statue, brush, mirror and prayer beads are placed close together...as if to ensure they are not seen as ‘mere objects’”,<sup>2</sup> and the mirror on the back wall “refers to the central theme of the image: the couple and their relationship”.<sup>3</sup> Indeed, for most scholars, objects placed throughout this painting, and other Eyckian paintings, are simultaneously descriptive and, on some level, ‘symbolic’. Following Panofsky’s analysis of the *Arnolfini Double Portrait* in 1934<sup>4</sup> and his influential and masterly study of early Netherlandish painting, published in 1953,<sup>5</sup> these objects have generally been interpreted in terms of primarily religious symbolism, as ‘disguised symbols’.<sup>6</sup> For generations of scholars, this particular approach to ‘symbolism’ in Eyckian painting represented a way of recovering their original meaning. According to such readings, the Arnolfini mirror could plausibly be seen, for example, as a symbol of Marian purity,<sup>7</sup> or as a metaphorical mirror of Christ’s Passion.<sup>8</sup> However, although many scholars have continued to read objects in van Eyck’s paintings in terms of their potential religious symbolism,<sup>9</sup> most have sought alternative social, cultural or religious contexts – which, it is argued, are demonstrably closer to the concerns of van Eyck and his

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<sup>2</sup> Ridderbos, 2005: 71-72.

<sup>3</sup> Ridderbos, 2005: 71.

<sup>4</sup> Panofsky, 1934.

<sup>5</sup> Panofsky, 1953.

<sup>6</sup> Panofsky was by no means the first to read the objects primarily in the context of Christian theology. de Tolnay, for example, had sought to demonstrate the relationship between van Eyck’s paintings and Modern Devotion since 1932. Panofsky’s 1953 publication was, however, by far the most influential study.

<sup>7</sup> Panofsky, 1953: 203.

<sup>8</sup> Baldwin, 1984: 57-75.

<sup>9</sup> The best example of this approach is perhaps Purtle, 1982. Hitchcock, 1976 interprets the iconography of the *van der Paele Virgin* almost entirely in relation to Durandus’s *Rationale divinatorum officiorum* (c.1284-95), with varying success. Goodgal, 1991 convincingly uses a treatise on the Eucharist written in 1440 by the prior of St. Bavo’s monastery as a context (as opposed to a source) for the Eucharistic iconography of the *Ghent Altarpiece*.

patrons – in which to interpret them.<sup>10</sup> The issue of what these objects ‘mean’ and how they convey this meaning is, however, still largely unresolved.<sup>11</sup>

This chapter addresses the distinctive way in which van Eyck’s paintings use the ‘specular’ (glass and metallic) objects that define the visual character of his work in potentially ‘symbolic’ or ‘allusive’ ways. As many of these objects, including the Arnolfini mirror, have already been the subject of extensive debate, this study considers an object which has received very little scholarly attention: the pair of spectacles held by the Canon in the *Virgin and Child with the Canon van der Paele* (1434-36) (Fig 1.4). Using this object as a case study, the chapter aims to assess the value and the limitations of reading specular objects in van Eyck’s paintings in terms of their ability to function as part of a symbolic programme. The final part of the chapter looks at the visual means van Eyck’s paintings use to actively promote ambiguity in identifying symbolic meaning, particularly in specular objects such as the Canon’s spectacles.

## 1.2. Methodological Questions

My research for this chapter began as an investigation into the iconographic and iconological significance of the Canon’s spectacles in the *Virgin and Child with the Canon van der Paele*. My approach broadly, but cautiously, followed Panofsky’s overly-criticised and unfashionable theory of ‘disguised symbolism’, in the belief that this approach would uncover a number of symbolic concepts connected with the most

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<sup>10</sup> Scholars have looked in particular at the context of popular religion. Harbison, 1985, for example, interprets van Eyck’s work in the context of meditational vision, and Harbison, 1993 looks at the role of pilgrimage. A number of authors, such as Rothstein, 2005, have looked closely at the relationship between panel painting and texts of the Modern Devotion. Others, such as Bedaux, 1986, have concerned themselves with deconstructing the concept ‘disguised symbolism’ altogether, either on the grounds that symbols are not ‘disguised’, or that objects need not be ‘symbolic’. I will discuss this in more detail later in the chapter.

<sup>11</sup> See Marrow, 1986 for a discussion of how, in his view, meaning is constructed by experience in this period, and also the response by Harbison, 1986.

evident concerns of the painting (including vision, piety and devotion). Furthermore, as an example of the kind of optical device I believe van Eyck was interested in and probably used, it seemed important to consider what this object might reveal about the interests of both the patron and the artist. In carrying out research for the chapter, however, I became aware of a number of problems and limitations with the methodology I was applying. As I was concerned with establishing the extent to which the spectacles referred to 'symbolic' or 'non-symbolic' ideas, my reading paid little attention to the wider concerns of van Eyck's practice. To what extent can or should we separate our reading of these objects from the concerns of van Eyck's naturalistic style? To what extent does van Eyck's representations of objects such as convex mirrors and spectacles suggest something of the artist's personal interests? Is the range of optical devices and effects in his paintings unique to his practice, and should we read these in the same way that we read objects in a painting by Campin? Should we even 'read' objects at all or are they able to carry allusive meaning on primarily visual terms? These are just a few of the questions for which my own methodology made little allowance.

The main part of the chapter presents my research on the symbolic value of van der Paele's spectacles in the form of a critical case study. I have chosen to divide the first part of the chapter quite rigidly into 'symbolic' and 'non-symbolic' readings. The 'non-symbolic' reading is concerned with the social and cultural implications of wearing, and being pictured with, spectacles. The 'symbolic' reading is concerned with how the spectacles function within an exclusively religious iconography. There are, of course, levels of symbolic meaning or connotation within these categories, which my discussion will account for. (Wearing spectacles, for example, is 'symbolic' of one's visual acuity and also suggestive of one's occupation). My decision to retain distinct categories of 'non-symbolic' and 'symbolic' is, however, intended to reflect,

on the one hand, the dominating tradition of Panofsky's 'disguised symbolism' (concerned primarily with recovering religious symbols), and, at the opposite extreme, the more recent trend in scholarship with devaluing symbolic interpretation altogether (usually conceived in direct opposition to Panofsky). The extent to which these categories can or should be separated will become apparent in the course of the discussion. It is intended that my approach should openly present both the values and the limitations of these readings before providing a more balanced reading of the painting toward the end of the chapter. This final section suggests a methodology which relies on a close analysis of how both symbolic and non-symbolic ideas are controlled visually in the painting.

Before looking at the case study, it is necessary first to outline Panofsky's influential concept of 'disguised symbolism' and also the more recent approaches that have developed in opposition to it.

### *Disguised Symbols*

In essence, Panofsky believed that religious symbolism is embedded in early Netherlandish paintings in the form of naturalistic, often down-to-earth, pictorial motifs. By carefully identifying relevant literary and visual traditions, he argued, these 'disguised symbols' can be detected, and 'read' as part of complex iconographic programmes. Although this theory enjoyed widespread approval for nearly half a century, scholars in recent years have become increasingly critical of its validity or usefulness as a methodological concept. The concerns with Panofsky's approach put forward by most scholars today fall broadly into one of three categories. First, some argue that Panofsky was largely mistaken in his belief that objects in van Eyck's paintings are 'saturated with meaning'.<sup>12</sup> They argue that the significance of many

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<sup>12</sup> For example Hall, 1994 and Bedaux 1986 and 1990.



objects can be explained adequately with non-symbolic interpretations. At the opposite extreme are those who believe that Panofsky was essentially correct and that his method has either been misinterpreted, or that scholars, including Panofsky himself, have simply not carried out their analyses with adequate attention to the safeguards Panofsky set out.<sup>13</sup> A third group (the majority), fall somewhere between these two views. For most scholars, Panofsky's approach is valid but requires a degree of modification, or even a rethinking of how symbolic status is ascribed to objects. For them, it is not a question of whether objects should or should not be understood in symbolic terms but rather a question of how this distinction is made and how prescriptive the rules that facilitate this decision should be.

Whilst most recent publications in the field have been quite openly critical of 'disguised symbolism', it is also apparent that no single credible approach has come near to replacing Panofsky's. Instead, there is a general trend in today's scholarship to accept or suggest non-symbolic readings more readily. The non-symbolic approach, however, is perhaps as problematic as Panofsky's symbolic method. Whilst disguised symbolism is predisposed to actively looking for (or even imposing) meaning, largely non-symbolic approaches, I would argue, are equally predisposed to the assumption that no meaning was intended. Furthermore, those who have advocated non-symbolic approaches have too often been content with the narrow purpose of disproving Panofsky, without proposing any useful or constructive alternative. Edwin Hall, for example,<sup>14</sup> rightly criticises the validity of some of Panofsky's specific readings of disguised symbols in the *Arnolfini Double Portrait* and highlights the fact that many of these objects could have been found in domestic interiors of the time. He is however unsuccessful in proving that these objects could not simultaneously have had

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<sup>13</sup> Most recently, Purtle, 1982.

<sup>14</sup> Hall, 1994.

additional symbolic meanings, and his suggestion that 'commonplace' or 'normative' objects are less likely to have been intended to refer to symbolic ideas than more unusual or distinctive objects seems inadequate and overly simplistic.

The application of technical studies has, in many ways, also fuelled the non-symbolic tendency that dominates current opinion. Technical evidence, however, tends to convey a false appearance of scientific objectivity which too easily covers underlying problems with how this evidence has been applied. Lorne Campbell, for example, has pointed out that most of the objects in the Arnolfini panel fundamental to Panofsky's theory of 'disguised symbolism' were added at a late stage of the process and cannot, he argues, have been conceived "according to any carefully worked out programme".<sup>15</sup> Objects not included in the underdrawing – such as the candle, the carving of St. Margaret, the oranges, the pattens and the dog – are therefore seen as "afterthoughts",<sup>16</sup> apparently proving that Panofsky's theory cannot be credible. This observation, however, fails to take account of the fact that other incontestably symbolic motifs in van Eyck's paintings were also not underdrawn. No scholar would argue, for example, that the majolica vase of lilies in van Eyck's *Washington Annunciation* was not intended as a Marian symbol, but this was also not included in the underdrawing, but added at a late stage.<sup>17</sup>

Since Panofsky's 1953 publication, the methodology of disguised symbolism has been applied with varying success to most early Netherlandish paintings. Unfortunately, it is through the lens of numerous diluted and somewhat simplified interpretations of Panofsky's approach, perpetuated by scholarship for over fifty years, that critics now view the usefulness of 'disguised symbolism'. Just as scholars,

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<sup>15</sup> Campbell, 1998: 182 and 201.

<sup>16</sup> Ainsworth, 2001: 114.

<sup>17</sup> Gifford, 2000: 63-64.

such as Hall, who have advocated a non-symbolic approach have characterised Panofsky's approach as a narrowly focused exercise in relating different textual sources to particular objects, those who advocate a symbolic approach have likewise often adopted a narrow understanding of its potential. It has been argued, for example, that the 'curtain sacks' often depicted suspended from the beds of Netherlandish domestic interiors of this period can be read as symbols of the Virgin's womb, on the improbable grounds that their shape resembles the fourth stomach of a cud-chewing animal which transformed matter by an 'embryogenic process' which might be compared to the way in which the 'Word was made flesh'.<sup>18</sup> Having more in common with modern (Freudian) notions, such arguments often lack the concern, central to Panofsky's intentions, with understanding ideas that were demonstrably alive at the time.

Panofsky himself is known to have been uncomfortable with the way his method was applied on occasions.<sup>19</sup> His theory was not, as many scholars have suggested, a practical programme for the deciphering of specific hidden symbols in images. In the context in which Panofsky devised his theory, the interpretation of individual elements in single works was always secondary to his central concern of decoding 'intrinsic' relationships within and between works of art.<sup>20</sup> Although his theory has become primarily an exercise in iconography, Panofsky's interest was primarily with the iconological concerns of the "underlying principles" revealed by images and the symbols they contain. Panofsky's famous chapter, 'Reality and

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<sup>18</sup> Koslow, 1986: 9-33.

<sup>19</sup> After hearing what he considered an over-imaginative interpretation of Van Eyck's *Arnolfini Double Portrait* at a Northern Renaissance symposium, Panofsky cautioned, in a private communication with William Heckscher, against reading symbols without applying 'historical methods' and 'common sense'. See Holly, 1984: 164 and Bedaux, 1990: 14 for these anecdotes.

<sup>20</sup> Holly, 1984: 159 notes that art historians not acquainted with the wider background of Panofsky's 'earlier work' (his 1915-25 theoretical papers) tend to take this somewhat narrow view of 'disguised symbolism'. The theory was in fact a revision of an idea implicit in much of this earlier work.

Symbol in Early Flemish Painting: “Spiritualia Sub Metaphoris Corporalium”<sup>21</sup> for example, was primarily concerned with the way in which the interdependent nature of a new naturalism and symbolism was structured at this time around the religious conviction that physical objects were corporeal metaphors of things spiritual.

Conversely, it is also important to recognise that some scholars who have broadly accepted the idea of disguised symbolism have applied the theory with arguably greater rigour than did Panofsky himself. Carol Purtle,<sup>22</sup> for example, has elucidated the metaphors and allegorical allusions of van Eyck’s Marian paintings with reference to a ‘symbolic vocabulary’ also found in mystical poetry, Mass and Office texts and Marian hymns. Although she argues for multi-level significance of objects in van Eyck’s paintings, her suggestion that van Eyck’s paintings contain an “intricate weaving of symbolic allusion”<sup>23</sup> is entirely consistent with Panofsky’s method.

A number of scholars have sought new approaches that do not require an outright rejection of the idea of ‘disguised symbolism’. These have suggested that Panofsky’s theory might be adapted, or that greater consideration should be given to how these symbols relate to popular beliefs and practices of the time. Much attention, for example, has been paid to vernacular works of the Modern Devotion<sup>24</sup> and meditation manuals<sup>25</sup> and how these texts inform the visual or visionary aspirations of the paintings. Others, such as Ward,<sup>26</sup> have argued that Panofsky’s method has been misinterpreted and that the key to understanding the ‘disguised symbolism’ of van Eyck’s paintings rests in more sustained analysis of how ideas are concealed or

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<sup>21</sup> Panofsky, 1953: 131-48.

<sup>22</sup> Purtle, 1982.

<sup>23</sup> Purtle, 1982: 172.

<sup>24</sup> Marrow, 1973 and Rothstein, 2005, for example.

<sup>25</sup> Falkenburg, 2001.

<sup>26</sup> Ward, 1994.

revealed in visual terms. (My final analysis shares Ward's concern with the visual aspects of van Eyck's symbolism, although I find some of Ward's examples unconvincing). Central to all of these approaches, however, is the recurring problem of how one makes a distinction between those objects which were intended to carry symbolic meaning and those, often within the same image, which were not.

### **1.3. A 'Non-Symbolic' Reading of Canon van der Paele's Spectacles**

In van Eyck's painting, the donor kneels before an enthroned Virgin and Child, clutching an open book (perhaps a Breviary) in his left hand and a pair of bow-framed spectacles in his right hand (Fig 1.5). Beside the fur almuce, a black leather spectacle case hangs suspended on a cord. One of the lenses of the spectacles casts a spot of light encircled by a shadow onto the book, distorting the text beneath. Van Eyck's illusion is so convincing as to suggest to the viewer that he is simply recording a real event.

With the exception of a few passing remarks, scholarship of early Netherlandish art has firmly placed the representation of spectacles within the category of 'incidental' or 'non-symbolic'.<sup>27</sup> The infrequency with which spectacles are mentioned is, however, not simply symptomatic of the current tendency to read images of this period 'non-symbolically'. Significantly, many scholars who have applied the iconographic method have not identified any possible religious symbolism in the spectacles. Carol Purtle, for example (whose approach is perhaps most closely derived from Panofsky), observed only that van der Paele's spectacles were "intended to refer to the Canon's own spectacles, but here they serve the additional purpose of showing that the words of the holy text could be made accessible to the Canon's

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<sup>27</sup> Mann, 1992: 37, for example, argues the spectacles are simply an attribute of van der Paele's character and old age.

openly near-sighted vision".<sup>28</sup> Likewise, Elizabeth Dhanens, in the most recent general monograph on the van Eycks, *Hubert and Jan van Eyck*, despite closely following Panofsky's theory of 'disguised symbolism' elsewhere, restricts her discussion of the Canon's spectacles to the observation that they "denote his function".<sup>29</sup>

Perhaps the most straightforward reading of the spectacles in this panel (implied in the above readings) is the proposition that van der Paele simply owned and openly used spectacles. In the painting, the Canon has clearly been using his spectacles to read his book. Evidently advanced in years, it seems reasonable to assume that he should be using spectacles to correct his presbyopic vision (the 'long-sightedness', or 'old-sightedness' specifically caused by old age).<sup>30</sup>

Although the painting itself is the only primary 'evidence' that van der Paele wore spectacles, the existing fragmentary records of his life also offer a degree of support to this assumption. By the time van Eyck began the painting, Canon Joris van der Paele was already between sixty-five and seventy years of age. There no longer exists any written record of van der Paele's possessions. However, we know that from 1396 van der Paele was an abbreviator (*Scriptor*) in the Papal curia at Rome.<sup>31</sup> He retired to Bruges in 1425 where he attended church services and said the daily offices as a secular canon at St. Donatian's Church. By November 1431, the minutes of the cathedral chapter noted he was having trouble attending Matins, and by September 1434, the minutes note that "...attenta infirmitate et senectute suis,

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<sup>28</sup> Purtle, 1982: 87.

<sup>29</sup> Dhanens, 1980: 218-19.

<sup>30</sup> An alternative reading, however, might be that the Canon was actually short-sighted, and that he has removed his glasses in order to read. As we now recognise, prolonged periods of close work such as reading and writing are directly linked to the onset of short-sightedness. There is however, no evidence that spectacles for the correction of short-sightedness were available before the 1460s, so the likelihood is that the Canon was probably presbyopic, or 'old-sighted'. The earliest reference to spectacles suitable for the correction of short-sightedness is the order sent by Duke Francesco Sforza of Milan in 1462. Ilardi, 1976. See also Introduction n.108 above.

<sup>31</sup> See de Keyser, 1971: 338.

inscribatur ad omnia lucra, sive veniat ad ecclesiam sive non".<sup>32</sup> Between 1437 and 1443, he is mentioned as 'infirmus' in the half-yearly register of the chapter.<sup>33</sup> Irrespective of whether the Canon's work contributed directly to his failing vision, the use of spectacles would certainly have been useful, if not essential, for his work in Rome and later in Bruges.

Perhaps the most concrete evidence we have about the Canon's vision comes from the painting itself. In 1981, the rheumatologist Jan V. Dequeker observed that the prominent arteries and scarring on van der Paele's temple are characteristic of the symptoms of temporal arteritis (a swelling of the artery walls affecting blood supply to the optic nerve).<sup>34</sup> A comparison between a modern photograph of a patient with the condition (Fig 1.6) and a detail from the painting (Fig 1.7) provides striking support for Dequeker's observation. Dequeker also suggested that the swelling in the Canon's left hand and its somewhat stiff appearance might also indicate polymyalgia rheumatica (a related condition which affects around 50% of people with temporal arteritis today). What Dequeker does not mention is that along with headaches, temple pain and fatigue, between 25% and 50% of people with temporal arteritis today also develop serious problems with vision, including blurred, double or reduced vision, brown- or grey-outs and, if left untreated, blindness in one or both eyes.<sup>35</sup> Whilst none of these problems would be treated with spectacles today, it is not unreasonable to suggest that the Canon's spectacles were intended to signify a problem with his eyesight brought on by this condition.

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<sup>32</sup> "...in view of his feebleness and old age, he should be put down for all payments, whether he comes to church or not." Quoted in Dequeker, 1981: 1598.

<sup>33</sup> Dequeker, 1981: 1598.

<sup>34</sup> Dequeker, 1981. With the exception of Lane, 1990, the significance of his observation has largely been overlooked by art historians.

<sup>35</sup> [http://www.rnib.org.uk/xpedio/groups/public/documents/PublicWebsite/public\\_mib003665.hcsp](http://www.rnib.org.uk/xpedio/groups/public/documents/PublicWebsite/public_mib003665.hcsp) (accessed 30/04/06) and, <http://www.ninds.nih.gov/disorders/vasculitis/vasulitis.htm> (accessed 30/04/06).

The case of biographical realism, however, only provides an answer to some of the issues raised by the inclusion of this attribute. Whether van der Paele owned a pair of spectacles or not, the key issue rests in why he should have wished to be pictured holding them. It is therefore necessary to consider the range of social connotations associated with using spectacles at this time.

A number of early images depicting scholarly saints wearing spectacles suggest an association between wearing spectacles and scholarly aptitude or education.<sup>36</sup> Certainly, the Canon was not only literate but also a reasonably well-educated man. As well as his experience as a scribe, van der Paele also received, in later life, the title *magister*, usually reserved for those with some university education.<sup>37</sup> Whilst the majority of extant images of scholars wearing spectacles date from the end of the fifteenth century (most of these depict St. Jerome, but this tradition only dates from after c.1490),<sup>38</sup> there are a few significant earlier images. A French Missal from c.1400, New York, Pierpont Morgan Library, ms 331, fol.187r. (Fig 1.8), for example, attributes an elderly St. Luke with a pair of spectacles as he sits writing. There are no indications that the artist intended the spectacles to operate on a level beyond an understanding that such a device would be appropriate for an image of a visionary scholar in his study. A French Book of Hours from c.1420, Milan, Bibl. Trivulziana, ms 445, fol. 15r. (Fig 1.9), substantiates the likelihood that the spectacles were not intended to function as specific symbolic attributes. The latter image shows St. Matthew holding glasses to his eyes to read from a manuscript held by an angel. The somewhat arbitrary fashion in which illuminators attributed the

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<sup>36</sup> Mann, 1992: 31-41 discusses spectacles as an attribute of the scholarly.

<sup>37</sup> de Keyser, 1971: 338. There is no record of van der Paele having attended any university in northern Europe. It is also possible that the title was given to him in return for his service to the Papacy.

<sup>38</sup> The tradition of showing Jerome with spectacles was particularly popular from the sixteenth century in the North when spectacles became a standard attribute in depictions of the saint in his study. The earliest extant example, however, is the image of Jerome wearing spectacles by the Spanish artist Bartolomé Bermejo in his *Pietà* panel (completed 1490, Museu de la catedral, Barcelona). For this painting, see Blanch, 2003.



Evangelists with spectacles indicates they were not intended as differentiating attributes of a particular figure, but rather simply derived from common models, or else were intended to refer to the more generic social associations between scholarly aptitude and weak vision.

Although these images are suggestive of certain bookish and scholarly connotations of wearing spectacles in the early fifteenth century, it is important to make a distinction between these anachronistic attributions of spectacles to historical and biblical figures and the idea of representing a living person, such as van der Paele, with them. Aside from their connotations of scholarship, spectacles were not generally a desirable attribute to be seen or pictured with. Despite being in widespread use by the fifteenth century,<sup>39</sup> it is striking how few images of living people exist from this period that show the subject with a pair of spectacles. Even those who are known to have used or worn spectacles were not typically ever pictured wearing or even holding them. As I have already noted, Philip the Bold probably used spectacles,<sup>40</sup> but was apparently never pictured with them. Surviving textual references to spectacles from this period also strongly suggest that their owners were reluctant to admit or openly display their reliance on them. Hence, in October 1462 when Duke Francesco Sforza of Milan wrote to his ambassador in Florence to request thirty-six pairs of spectacles, he was careful to add the following (disingenuous) qualification: “Li qualite aviso non volemo per nostro uso, perché per la grazia de Dio nuy non ne havemo bisogno...”.<sup>41</sup> Similarly, the Privy seal scribe Thomas Hoccleve claimed in a ballad to

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<sup>39</sup> Most early references to spectacles come from inventories and wills and therefore tend to be examples made from precious materials. Customs records from London indicate large quantities of cheaper spectacles were exported from the Low Countries from the late fourteenth century. 1151 pairs were imported through the port of London from the Continent from July to September 1384. See Rhodes, 1982: 4-6, and Dreyfus, 1994: 305.

<sup>40</sup> See Introduction, n.116.

<sup>41</sup> “We inform you that we do not want them for our use because, thank God, we do not need them...”. Ilardi, 1976: 345-46.

the Duke of York (1411) that despite having strained his eyes for twenty-four years, he was too proud to wear spectacles.<sup>42</sup> As only convex lenses were available until the 1460s, spectacles were most commonly used to correct presbyopia (long sight due to old age) and were therefore commonly associated with old age.<sup>43</sup>

The dominant social connotations of old age, and perhaps also scholarly aptitude, were certainly appropriate for a man of van der Paele's age and status. However, the obvious reluctance to be seen wearing such conspicuous and uncomfortable devices (they had to be clipped or perched on the nose) also makes the Canon's decision to be pictured with his spectacles an unusual one. It therefore seems reasonable to consider whether there was an additional iconographic motivation to including spectacles in the painting.

#### **1.4. A 'Symbolic' Reading of Canon van der Paele's Spectacles**

Although there are a number of 'non-symbolic' reasons why van der Paele might have been pictured with his spectacles, each of these possibilities is in some way problematic. Moreover, no literalist explanation is able to discount the possibility that they were simultaneously intended to operate symbolically as part of a wider iconographic programme.

The painting includes a number of 'obvious' or 'open' symbols which prevents an entirely non-symbolic reading of the painting and raises questions about how symbolic status is attributed or signified. Donatian is given his usual attribute of a wheel with five lighted candles, for example, and Christ is pictured holding a parrot. Both objects are integrated illusionistically into the composition, but we are in no

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<sup>42</sup> Thomas Hoccleve, *Ballade to my Gracious Lord of York*. For this, and a thorough discussion of Hoccleve's failing sight in the context of his writing, see Gayk, 2005: 47-74.

<sup>43</sup> Duke Francesco Sforza's 1462 order for spectacles, for example, refers to "those apt and suitable for near vision, that is for the elderly". Ilardi, 1976: 345 and 358-59.

doubt that both have a symbolic value: Donatian's wheel might be described as an 'open symbol' that would have been recognised by anybody familiar with the saint's life or established image. The parrot is also 'open' in the sense that we recognise its symbolic status, although it is doubtful whether all viewers would necessarily have known exactly what it was intended to symbolise.<sup>44</sup> The status of other objects is more ambiguous, however, such as the carved scenes on the Romanesque column capitals, the carvings on the arms of the Virgin's throne and the collection of items (including the spectacles) the Canon himself holds. Unlike the wheel and the parrot, each of these latter objects does not require a symbolic explanation to justify its place in the painting. We might equally see them as 'disguised symbols' or as non-symbolic objects.

Symbolism therefore operates on different levels of concealment, ranging from obvious to ambiguous, or 'open' to 'disguised'. Seen in this context, a predisposition to looking for symbolic value is not problematic or anachronistic, as some authors have suggested, but is actually in keeping with how one looks at the image: drawn in by symbols they recognised, and perhaps understood, viewers might naturally have sought the same value in other objects in the painting. In doing so, viewers are likely to have arrived at readings that were not intended by van Eyck. As some scholars have argued, this laxity of 'symbolic value' is in many ways encouraged by these progressive levels of concealment.<sup>45</sup> (I shall return to this idea later in the chapter).

Concerning the intended symbolic value of depicted objects, Panofsky himself set out the following three 'safeguards' for disguised symbols which were designed to prevent over-interpretation: First, one must establish if symbolical significance is "a

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<sup>44</sup> These two objects are discussed later in the chapter.

<sup>45</sup> For example, Ward, 1994.

matter of established representational tradition"; second, whether one can justify a reading according to a text or ideas demonstrably alive at the time; and, finally, one must ask if the interpretation is in keeping with the "personal tendencies" of the individual master.<sup>46</sup> In the following analysis, I will apply these safeguards to a strictly symbolic interpretation of van der Paele's spectacles. After establishing an existing visual and textual tradition of a relevant iconography of spectacles, I will consider a range of problems in applying this tradition to van Eyck's painting. My final analysis suggests a reading of the motif and its significance within the wider optical concerns of van Eyck's practice.

#### **1.4.1. Established Textual and Visual Traditions**

To this point, my discussion of the Canon's spectacles has given little consideration to the context of the painting's concerns. Most significantly, van der Paele is not presented as a passive patron, separated from the main subject of the Virgin and Child. In fact, the Virgin and Child are apparently made visible to us either as a vision experienced by the canon or as a visualization of his devotional aims.<sup>47</sup> If his spectacles were intended to operate symbolically, one might reasonably expect that they should relate to the religious and devotional concerns of the painting's iconography.

To my knowledge, only one plausible interpretation of van der Paele's spectacles has so far been offered which considers their possible relationship with the religious and devotional concerns of the panel. The reading derives from Craig Harbison's well-known argument that painted patrons in early Netherlandish paintings are often pictured in states of visionary experience, and that in the case of

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<sup>46</sup> Panofsky, 1953: 142-43.

<sup>47</sup> For a discussion of this, see Harbison, 1985.

van der Paele, the Virgin and Child are “the product of his devotional imagination”.<sup>48</sup> In this article, Harbison notes both that van der Paele’s glassy stare might be intended to signify this visionary state and also that the removal of his spectacles draws attention to a specifically earthly form of vision. More recently, Bret Rothstein has developed Harbison’s theory, seeing the Canon’s spectacles as symbols of weak bodily vision and of the fallibility of the senses generally.<sup>49</sup> He argues that “the removal of those lenses signifies that the Canon has not simply departed from external visual input...but has entered a meditative state that excludes sensory stimulation altogether”.<sup>50</sup>

Crucially, Rothstein’s analysis of van der Paele’s spectacles is based entirely on their ability to function symbolically within the visionary, devotional context in which he considers van Eyck’s painting. He makes no reference, however, to the social, cultural and religious ideas associated with wearing or representing spectacles. Although his interpretation of the spectacles seems convincing as part of a close reading of the painting, my own research has found no evidence of visual or textual traditions in which spectacles carried this kind of symbolic meaning at this time.<sup>51</sup> Conversely, among the large number of paintings showing patrons apparently ‘disengaged’ from their visual surroundings (a sign of the ‘visionary’ nature of their devotion, according to Harbison and Rothstein), only van der Paele is depicted with spectacles. Van der Paele is, to my knowledge, the first patron in art to be shown with spectacles (based on surviving evidence, of course). If Rothstein’s reading is correct, the Canon’s spectacles would also be the earliest example of spectacles being used as symbols of ‘nonsensate’ visionary experience.

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<sup>48</sup> Harbison, 1985: 101.

<sup>49</sup> Rothstein, 1999: 262-276, and Rothstein 2005: 49-91 esp.

<sup>50</sup> Rothstein, 1999: 262.

<sup>51</sup> It is possible that Sluter’s Jeremiah, discussed below, may refer to a similar idea, however. Neither Rothstein nor Harbison mention this example.

Rothstein's analysis raises an important issue in the application of the iconographic method. His reading implies that van Eyck's symbolic use of van der Paele's spectacles is unique to this painting. Whereas other artists suggested the same idea by depicting patrons staring around and through objects, van Eyck, Rothstein suggests, chose to convey this 'disengagement' with sensory experience more explicitly by showing the Canon with his spectacles. Although this interpretation is sensitive to the wider concerns of his reading, it also appears weakened by the absence of contextual evidence and congruous examples of this symbolism. According to Panofsky, symbolic objects should always relate to *existing* symbolic ideas, demonstrable as part of established visual and textual traditions. In the context of these traditions, symbolic ideas can be identified more easily and demonstrated more convincingly. The problem with this approach, however, is that, unlike Rothstein's approach, it makes little allowance for invention or uniqueness, of which van Eyck was more than capable. Furthermore, examples that do not fit into these traditions tend to be either ignored or treated as 'descriptive' details as opposed to 'symbols'.

Accounting for potentially unique symbolic objects also presents problems with how congruous visual examples are identified. In comparison with van Eyck's painting, one of the most pertinent examples of a figure using spectacles is Claus Sluter's sculpted figure of the prophet *Jeremiah* (1403-04) on the so-called *Well Of Moses* (1395-1404) (Fig 1.10), who was originally given a pair of copper spectacles.<sup>52</sup> As van Eyck is likely to have been familiar with this sculpture, an explanation for the significance of the prophet's spectacles might offer some clue as to the function of van der Paele's spectacles. There is, however, no visual tradition in which Jeremiah is

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<sup>52</sup> See Archives Départementales de Cote-d'Or, Dijon, B11673, fol. 134 in Prochno, 2002: 314 for the January 1403 payment from Sluter and Malouel to Hennequin of Dijon, for making and delivering a copper crown for the Magdalene on the platform of the cross, and a pair of copper spectacles for Jeremiah.

pictured with spectacles.<sup>53</sup> It is quite possible that Jeremiah is part of the more general visual tradition I noted above, in which scholars, and especially elderly scholars, were attributed with spectacles when reading.<sup>54</sup> The way in which Jeremiah squints his eyes slightly, holding the book at a distance, perhaps refers to his presbyopic ('old-sighted') vision. This particular reference is likely to have had some resonance with Sluter's patron, Philip the Bold, who apparently had used spectacles for reading since about 1389, and in 1403 apparently ordered a silver plate to be put into the binding of his Book of Hours to hold them.<sup>55</sup>

Alternatively, Jeremiah's spectacles may have been intended to function within the wider devotional iconography of the sculpture, in relation to his own prophetic text written on the scroll. Certainly, his spectacles emphasise not only the act of reading, but also the textual authority of his prophecy – "O vos omnes qui transitis per viam attendite et videte si est dolor sicut dolor meus"<sup>56</sup> – which is visibly carried out in the Crucifixion scene on the terrace above.<sup>57</sup> Similarly, the spectacles may have been intended to emphasise the nature of the prophet's vision, his function as a 'seer' (perhaps in contrast to his failing bodily sight). As there is no visual or textual tradition on which to base these interpretations, however, such suggestions remain somewhat speculative.<sup>58</sup>

Although Panofsky's safeguards of visual and textual traditions do not make sufficient allowance for innovation, they are, I would argue, a requirement of any

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<sup>53</sup> I am not aware of another example of Jeremiah being pictured with spectacles. Neither Greeff, 1929 nor Mann, 1992 mention any examples.

<sup>54</sup> Snyder, 1985: 67, for example, notes that Jeremiah "looks like a scholar, wearied by his prodigious learning".

<sup>55</sup> See Introduction, n.116. I thank Dr. Tom Tolley for bringing this connection to my attention.

<sup>56</sup> "O all ye that pass by the way, attend, and see if there be any sorrow like to my sorrow".

<sup>57</sup> See Nash, 2005 and Nash, 2006 for a comprehensive analysis of the Crucifixion scene, which probably showed Mary Magdalene clasping the base of the cross. Nash argues that Jeremiah (along with David) was aligned prominently with the front face of the cross.

<sup>58</sup> Part III of Susie Nash's study on the 'Well of Moses' (forthcoming) may, however, shed light on this particular issue.

thorough iconographic reading. The extent to which any symbolic object should be considered part of an existing tradition, a new tradition, or simply a unique case, can only be evaluated after the ideas associated with established traditions have first been identified and analysed. I would argue that the Marian devotional concerns of van Eyck's painting provide the most likely context in which the Canon's spectacles might have functioned as 'symbols'. Before looking more closely at van Eyck's painting, therefore, I should like to outline the existence of visual and textual traditions in which spectacles, and glass objects generally, were used symbolically to refer to devotional notions relative to the Virgin Mary.

In 1945, Millard Meiss demonstrated that Flemish painters from the late fourteenth century, such as Melchior Broederlam, began to depict sunlight passing through glass windows in Annunciation scenes. He suggested, convincingly, that this striking image was a visual equivalent of a common optical simile used to describe Christ's Incarnation in a number of earlier and contemporary theological treatises, poems and hymns.<sup>59</sup> One of Meiss's key examples was van Eyck's Berlin *Madonna in a Church* (c.1426-28) (Fig 1.11) which, he pointed out, originally had an inscription on the frame taken from the second stanza of the Nativity hymn *Dies est Laetitiae*.<sup>60</sup> The fifth stanza of this same hymn contained an example of the optical simile, suggesting that van Eyck was well aware of this specific symbolic implication of light passing through glass. The verse reads:

Ut vitrum non laeditur

Sole penetrante

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<sup>59</sup> The analogy is very well known and still generally accepted as a credible interpretation. Meiss 1945: 175-81.

<sup>60</sup> The inscription on the lower frame read, "FLOS FLORIOLORUM APPELLARIS", and around the other three sides was written: "MATER HEC EST FILIA/ PATER HIC EST NATUS/QUIS AUDIVIT TALIA/DEUS HOMO NATUS ETCET". ("This mother is the daughter/ This father is born./ Who has heard of such as thing?/ God born a man"). Meiss, 1945: 179.



Sic illaesa creditur  
Virgo post et ante.<sup>61</sup>

The relatively formulaic composition of van Eyck's Marian paintings has invited scholars to perpetuate the reading of this same visual metaphor in each of the artist's panels. The throne room in each case is seen as an equivalent of the Virgin's body into which the metaphysical light of Christ passes.<sup>62</sup> Moreover, other glass objects such as the flasks half-filled with water on the *Lucca Madonna*, and the exterior of the *Ghent Altarpiece* (completed 1432) (Fig 1.12), have been understood as Virgin chambers into which (refracted) light passes.<sup>63</sup> As Carol Purtle has suggested, the association with the vessel form underscores the Incarnational emphasis of this symbol in proposing the flask as a receptacle for Christ's light.<sup>64</sup>

The topos of the light passing through glass was well-established by the fifteenth century and its Incarnational meaning would have been readily understood to a contemporary viewer.<sup>65</sup> This textual simile was established as early as the fifth century (probably in North Africa),<sup>66</sup> and became particularly prevalent in twelfth-century texts such as those attributed to St. Bernard, Adam of St. Victor and Alexander Neckam.<sup>67</sup> The popularity of this concept continued in later texts such as Chrétien de Troyes' *Queste del Saint Graal* (c.1225) and the poems of Rutebeuf

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<sup>61</sup> "As the sunbeam through the glass passeth but not staineth, Thus the Virgin, as she was, Virgin still remaineth". Meiss, 1945: 179-80.

<sup>62</sup> Purtle, 1982, for example, applies this reading to all of Van Eyck's Marian works.

<sup>63</sup> See, for example Purtle, 1982: 33-34, 70, 121 and 154. See also Madigan, 1986: 227-30.

<sup>64</sup> Purtle, 1982: 121-22.

<sup>65</sup> Art historians such as Meiss, 1945 have not really noted just how widespread was this analogy in the fifteenth century. It features in hundreds of literary works in Latin and Celtic languages as well as most other European languages. For a selection of these, see Breeze, 1991: 53-64.

<sup>66</sup> The oldest use of the simile appears in a North African sermon, falsely attributed by art historians since Meiss to St Augustine (354-430). For this, see Breeze 1991: 59.

<sup>67</sup> For Adam of St Victor and Alexander Neckam, see Hirn, 1958: 244. For St. Bernard, see Salzer, 1886-94: 74.

(fl.1250-80).<sup>68</sup> The image also featured from the thirteenth century in popular Marian hymns such as *Salve Porta crystallina* (“Sicut vitrum radio solis penetratur, inde tamen laesio nulla vitro datur, Sic, immo subtilius matre non corrupta, deus dei filius sua prodit nupta...”).<sup>69</sup> By the fifteenth century, the simile occurred with increasing frequency in hymns such as *Dies est laetitiae/in ortu regali* (fifteenth century) and *Mira Dei caritas, Deus incarnitur* (fifteenth century).<sup>70</sup>

Significantly, the topos was never reliant upon the form of the glass object visualised. St. Bridget of Sweden (c.1302-73) in the Latin text of her *Revelationes* conveys how Christ told her, “Quia sicut Sol vitrum ingrediendo non laedit, sic nec virginitas Virginis in assumptione humanitatis meae corrupta est”.<sup>71</sup> However, the Swedish version of the same line of text reads, “...I iomfrunna inälwe swa som solin skinande gynom renastan sten älli glas”.<sup>72</sup> Whilst it was certainly natural for artists like van Eyck to translate this concept into familiar objects like windows and crystal flasks, the textual sources most frequently had little to say about the form of the glass. It is presupposed only that the glass is transparent and pure.

Concurrent with the light through glass topos was a tradition of associating the Virgin more generally with specular materials and objects – including mirrors, lenses and spectacles – made from these materials. The body of the Virgin had increasingly been compared with glass, crystal and beryl objects from the twelfth century. Germanic mystical literature of the twelfth to the fourteenth century compared the Virgin with the transparency or brightness of beryl in over seventy-five works.<sup>73</sup>

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<sup>68</sup> For these, see Dagens, 1949: 525-26, and Hirn, 1928: 34.

<sup>69</sup> “As a ray of the sun through a window can pass and yet no hurt is done to the translucent glass, so, but more subtly, of a mother untried, God the Son of God, comes forth from His bride,” Hirn, 1958: 244.

<sup>70</sup> Walther, 1963-1967: 29914c, 29917.

<sup>71</sup> Saint Bridget, *Revelationes*, in Hirn 1958: 245. “For as the sun penetrating a glass window does not damage it, the Virginity of the Virgin is not spoiled by my assumption of human form.”

<sup>72</sup> “...into the Virgin’s bosom like the sun passing through a transparent stone or glass”. Hirn, 1928: 35.

<sup>73</sup> See Salzer, 1886-94: 205-08.

Perhaps the most explicit of such examples is a passage from the fourteenth-century spiritual biography of Gertrude of Helfta:

Apparuit etiam Virgo inclyta in caelesti gloria Filio assidere honorifice sublimata. Cumque cantaretur responsorium Descendit de caelis, Dominus quasi in verbis illis commonefactus amantissimae dignationis illius, qua de sinu Dei Patris descendens per uterum inviolatae Virginis nostrae miseriae exilium introivit...Apparuit quoque immaculatus uterus Virginis gloriosae ad instar purissimae crystalli perspicuus, per quam omnia viscera ejus divinitate medullitus pertransita et repleta refulgebant, velut aurum diversi coloris serico convolutum elucere solet per crystallum. Videbatur etiam puerulus ille floridus, summi Patris unicus, cor Matris virgineae avida delectatione sugere.<sup>74</sup>

The way in which the above passage describes the act of looking through the Virgin's crystal womb is striking as a parallel to the segments of rock crystal placed in reference to the Virgin's womb in contemporary devotional objects. The *Visitation* statuette from the Dominican convent of Katharinenthal, attributed to Heinrich of Constance (c.1310) (Fig 1.13), is almost a visual manifestation of the above description of the Virgin's womb of crystal.<sup>75</sup> Although the cabochons were primarily a means of making visible an object placed into the cavity (Mary's cabochon originally contained an image of Christ), the choice of material must also have maintained some resonance with the same wider devotional concerns evident in descriptions such as Gertrude's vision. As Jeffrey Hamburger and others have argued,

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<sup>74</sup> Gertrude of Helfta *Le héraut*, Oeuvres spirituelles 2-4, SC 139 and 143, quoted in Hamburger, 1989: 168, with the following translation: "Then there appeared the Virgin mother, raised to the honour of sitting with her Son in heavenly glory. And as the response, 'Descendit de caelis' was being sung, these words seemed to remind the Lord of the most loving condescension that had made Him descend from the breast of the Father and enter, by the womb of an inviolate virgin, into our miserable exile...There also appeared the immaculate womb of the glorious Virgin, as transparent as the purest crystal, through which her internal organs, penetrated and filled with divinity, shone brightly, just as gold, wrapped in a silk of various colours, shines through a crystal. Indeed, one saw the little blossoming boy, the only Son of the highest Father, nurse avidly in delight at the heart of His virgin mother".

<sup>75</sup> Mary and Elizabeth both have the same crystal wombs. Belting, 1994: 416 suggests that the similarity of the two figures reflects a devotional ideal of imitating and resembling the Virgin.

there was clearly some interdependence between textual and visual traditions.<sup>76</sup> Whatever the precise relationship between text and image here, however, it is certainly the case that both the statuette and the description of the vision place their primary emphasis on a direct analogy between the properties of crystal and the womb of the Virgin.

Among the most pervasive metaphors and descriptions of the Virgin are those that describe her as bright, sparkling, shining or brilliant. Etymologically, many of the vernacular words associated with brightness and brilliance derive from beryl. The French words 'briller', 'brillant' (*to shine*; and, *bright* or *brilliant*) derive from the word beryl, or 'beryllus', as does the Italian *brillare* (*to shine*). It is significant, in this context, that the common vernacular term for spectacles in French, Dutch and German was in fact 'beryls' (Middle French *bericle*, Old Dutch *beril*, *berikel*, *berille*, Middle High German *berille*, *barille*, *brill(e)*, New High German *brille*).<sup>77</sup> It would not, therefore, have taken a great cognitive leap on the part of the viewer to interpret a pair of spectacles in a Marian work as a reference to the clear, gem-like, or glass-like purity of the Virgin. It may be, therefore, that van Eyck in his painting of van der Paele is likewise drawing a visual comparison with the brightness of the Virgin, referred to in the inscription, and the brilliance of the crystal quality 'beryls' the Canon displays to the Virgin and viewer.

From the thirteenth century, concurrent with the development of the objects themselves, the Virgin was compared not simply with glass, but more frequently with glass lenses and their properties. Contemporary with the earliest (modern) references to the use of crystal and glass as aids to reading, the Virgin was compared metaphorically with the magnifying glass. In c.1275, the *Minnesinger* Konrad von

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<sup>76</sup> Hamburger, 1989: esp 166-78.

<sup>77</sup> For these, and a discussion of the etymological connections between beryl, spectacles, eyes and eyesight see Doesschate, 1946: 660-664. German etymological definitions taken from Kluge, 1963. French definitions taken from Baldinger, 1974 and Dauzat, 1947.

Würzburg in his epic poem *Die Goldene Schmiede* used a number of metaphors relating to the nature of the Virgin.<sup>78</sup> Among these, he identifies the Virgin at line 732 with a mirror (“Du bist gelich dem Spiegel”). Later, at line 842, the poet compares the Virgin to a crystal stone and a beryl (“Dir ist der cristallenstein gelich und der berille”). The poet makes the analogy again at line 1797 (“du bist...dem cristallinen steine”). At this point the poet describes the properties of this ‘crystal stone’ (the Virgin herself) as those of a lens with ‘great powers’ to enlarge text:

...hat an im die grozen und die gewalteclichen art  
daz nie kein schrift so klein wart  
ir schin enwürde breiter  
ob dirre stein vil heiter  
sie dahte und übergrisse:  
Swer in ot dünne sliffe  
und uf die schrift in wolte haben  
ern saehe ir kleinen buochstaben  
durch in groezer schinen.<sup>79</sup>

As glass technology became more sophisticated, the range of available glass metaphors and their associated connotations became proportionally more complex. From the thirteenth century, glass mirrors were also frequently used as magnifying lenses, primarily as an aid to reading. Jean de Meun demonstrates in *Roman de la Rose* (c.1275) a sophisticated understanding of the effects of applying a mirror to

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<sup>78</sup> Around c.1275, Albrecht Scharfenberg in his epic poem, *Der Jüngere Titurel* also employed the metaphor of a magnifying beryl to identify the Grail: “Sam der berillus grozzet die Schrift im so lesene.” Greeff, 1958: 9.

<sup>79</sup> Konrad von Würzburg, *Die Goldene Schmiede*, 1798-1809. “...it (the crystal) has in it such great powers that no writing be ever so small that it did not appear larger (broader) in it if the very joyous stone was brought closer and held over it. If someone ground it thin and wanted to hold it on the writing he would see through it the little letters appear larger.”

one's vision. He relates how Mars and Venus could have escaped Vulcan's nets if they had looked into a magnifying mirror and seen the fine threads of the nets appear as large as great beams:

Mars et Venus qui ia pris furent  
Ansamble ou lit ou il se iurent,  
S'il ainz que seur le lit montassent,  
En tex mirouers se mirassent,  
Mes que leurs mirouers tenissent  
Si que le lit dedanz veissent  
Ja ne fussent pris ne liez  
Es laz soutilz et deliez...  
Car chascuns laz plus d'un grant tré  
Leur parust estre gros et lons...<sup>80</sup>

Nature goes on to expound the properties of glass mirrors as magnifying and diminishing lenses:

Oncor ont mirouer, dist ele,  
Mainte autre force grant et bele,  
Car choses granz et grosses, mises  
tres pres, samblent si loign assises,  
fust neis la plus grant montaigne  
qui sont antre France et Sardaigne,  
qu'eus i peuent estre veües  
si petites et si meues  
qu'anviz les porroit l'an choisir,  
tant i gardast l'an a loisir.<sup>81</sup>

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<sup>80</sup> de Lorris and de Meun, *Le Roman de la Rose*, 18031-38 and 18046-47. "If Mars and Venus, who were captured in bed where they were, had looked at themselves in such a mirror before they got into bed, provided they could see the bed in it, they would never have been taken or bound in the fine, thin nets...because every net would have appeared to them thicker and longer than a large beam..." Translation from McWebb, 2006: 44.

<sup>81</sup> de Lorris and de Meun, *Le Roman de la Rose*, 18123-32. "'Mirrors still have many other great and wonderful powers', said nature. 'Large, bulky objects set very close seem set so far away that even the largest mountains between France and Cerdagne can be seen so small, so tiny, that one could hardly

Mirrors were frequently employed as lenses, much like spectacles, to magnify fine text in manuscripts.<sup>82</sup> The fact that mirrors were used in this capacity is, however, seldom noted in discussions relating to Eyckian paintings. The ‘speculum immaculatum’ epithet inscribed on the frame of the van der Paele panel, although making a primary reference to divine wisdom and the Virgin Mary, cannot be considered in isolation from the actual and perceived properties of real mirrors also as lenses. Contemporary with the development of such early aids to vision, the Virgin was compared by the German Minnesinger Meissner (1260-1280) to this kind of magnifying glass-mirror in a poem preserved in the *Manesse Codex* (Codex Palatinus Germanicus 848, Heidelberg University Library, c.1304-40, fol. 342r.).<sup>83</sup> As in the inscription around the frame of the van der Paele panel, it is the brightness of the flawless glass that invites the poet to describe Mary as “spiegellichte” (bright as a glass).<sup>84</sup> The poet relates how, when we reach an age where fine writing becomes difficult to read, we must rely on an aid to vision. This he describes as a ‘clear mirror’ (spiegel klar):

Swenn(e) uns daz alter die gesiht  
 betimbert al ze sere  
 daz wir die edelen schrift niht  
 wol gesehen mügen mere  
 so sint unser kere  
 zuo z’ einem liechten Spiegel klar

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distinguish among them, no matter how long one kept at it’ ”. Translation from Dahlberg, 1983: 302.

<sup>82</sup> The clearest visual example of a mirror being used as a magnifier is Tomaso de Modena’s famous portrayal of St Jerome using a mirror as an aid to reading. For a brief discussion of this see Gibbs, 1989: 85.

<sup>83</sup> Extracts from the *Manesse Codex* are from Pfaff, 1899-1909 (hereafter cited as *MC*).

<sup>84</sup> Meissner, *MC*, fol. 342r., col. 1118.

Der uns die schrift erliuhten kan  
unt wol gesihtik machen,  
so wir si dur in sehen an;<sup>85</sup>

Likewise, the poet continues, just as the mirror “clarifies the script for us”,  
Mary turns the blindness of sinners back to the sighted grace of God:

...und als uns der sünden gift  
an saelikeit erblendet  
daz Got von uns die gnade sin vil haslich hat gewendet,  
diu spiegellichte Maria die gnad uns wider sendet  
und mit suon' verendet  
waz gen ir kint uns ie gewar<sup>86</sup>

The mirror, therefore, becomes a religious simile, which both describes the action of the mirror as a visual aid and also attributes this optical property to the nature of the Virgin as an intercessor of sinners.

There was, therefore, a wider tradition – which existed alongside the topos of light passing through glass – of describing the Virgin using optical, primarily specular, metaphors and similes. The frequency with which words such as mirror, glass, beryl, bright, shining, crystal were applied to descriptions of the Virgin suggests that many early viewers would have been familiar with the Marian connotations of this kind of language.

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<sup>85</sup> Meissner, *MC*, fol. 342r., col. 1118. “When old age darkens our sight so that we cannot see the precious script well anymore, then we turn to a light, clear mirror which can clarify the script for us and make it legible, if we look at it through the mirror...”

<sup>86</sup> Meissner, *MC*, fol. 342r., col. 1118. “...when the punishment of sin darkens our happiness, so that God has turned away in hostility His Grace from us, so then Mary sends us, like a bright mirror, the Grace back, and perfects with reconciliation what her Child had always granted us.”



In addition to their status as glass objects, it is perhaps significant that spectacles were used almost exclusively to enlarge text. As spectacles with concave lenses were not available until the 1460's, spectacles prior to this all had magnifying convex lenses. Employed symbolically, spectacles therefore carried associations with enlargement and magnification. Central to this association was the lexical understanding, common to our own culture, of magnification as a concept. Judith Neaman has demonstrated that the verb *magnificare* 'to magnify', in the thirteenth century, had the same primary and secondary meanings in Greek, Latin and Hebrew as it does today in all modern languages.<sup>87</sup> Whilst its primary meaning was Biblical, meaning 'to praise, exalt or extol' (in a metaphorical sense), its secondary meaning was optical, literally meaning 'to enlarge or amplify' (either by size or number).

A Utrecht Book of Hours (Hague MS10.F50 c.1460), illuminated by Lieven van Lathem and the Master of Catherine of Cleves,<sup>88</sup> suggests that the concept of magnification was understood on such dual terms. Within the Lauds of the Virgin a somewhat caricatured image of a bespectacled scholar has been included in the left margin of fol. 26v. (Fig 1.14). The scholar in this marginal image lifts the spectacles up to his eyes with his right hand as he tips back his head to read the text in the book he is holding. Van Lathem appears to mock the condescending countenance of those forced to tip their head back and look down their nose in order to use their spectacles. The tone of the image, however, is perhaps less significant than its placement. The scholar accompanies the refrain, repeated throughout the accompanying Psalm (148), which repeatedly invokes magnification in the repetition of the word "Louet" (Praise, laud or magnify). Of the fourteen verses, seven invoke the reader to "Praise the Lord" (each using the same verb, "loven"). Immediately beside the image of the scholar, the

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<sup>87</sup> Neaman, 1991: 105-21.

<sup>88</sup> The Master of Catherine of Cleves executed the full-page miniatures and the border decoration is entirely by van Lathem after the thirteenth gathering. See Marrow, 1989: 103.

text also uses the verb “verhogen”, meaning to exalt, or increase in value, amount or strength: “...louen den name des heren want sijne name alleen verhoget is.”<sup>89</sup> It is therefore tenable that the scholar who is pictured literally magnifying the words of his text refers to the metaphorical concept of magnification as a synonym of praise, exaltation and amplification. (He literally ‘magnifies the Word’).

The act of magnification had a particular devotional significance in relation to the Virgin herself. Undoubtedly, the greatest Biblical example of magnification is that of the Virgin’s response to the news of her divine pregnancy in Luke 1.46-55, the Magnificat. As Judith Neaman suggests, the Virgin’s canticle of joy is itself a testament to the Virgin’s magnifying role in Christ’s Incarnation.<sup>90</sup> Christ magnified Mary in elevating her from handmaiden to mother of God. “In making her His instrument...He magnified her flesh even as her soul magnified him.”<sup>91</sup>

A number of images from the late thirteenth century to the early sixteenth appear to use the magnifying connotations of spectacles as a symbolic reference to the Magnificat. A possible early example of this tradition comes from the Ghent Psalter BR MS5163-4 Bibliothèque Royale, Brussels, dated c.1250-70, in which a bird is pictured in the left margin of fol. 32r. apparently wearing spectacles (Fig 1.15). The manuscript has received some attention from historians of science as the image actually predates the announcement of the invention of spectacles in Italy c.1285-6. Although it is possible that the spectacles were added at a later date, or that the manuscript itself has been inaccurately dated, the placement of this unusual image is particularly significant. The bird with its spectacles accompanies the text of a Psalm in which the concept of magnification echoes the same concerns of a verse from the

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<sup>89</sup> “...praise the name of the Lord, for his name alone is exalted.” The following verse at the bottom of the folio repeats the verb “verhogen” also.

<sup>90</sup> Neaman, 1991: 105-08.

<sup>91</sup> Neaman, 1991: 108, who cites a number of thirteenth-century textual examples of this understanding.

Magnificat. Psalms 33 and 34 are adjacent to the drôlerie of the bespectacled bird.<sup>92</sup>

Psalm 33:4 refers significantly to praising, or “magnifying” the name of the Lord:

Magnificate Dominum mecum

Et exaltemus nomen ejus in id ipsum<sup>93</sup>

More specifically the verse echoes the Virgin’s Canticle of Joy (in Luke 1: 46-55) in response to the news of her pregnancy:

Et Ait Maria magnificat anima mea Dominum

et exultavit spiritus meus in Deo salutari meo.<sup>94</sup>

The bespectacled bird adorning the border of this Psalm might therefore be the earliest text-image association relating the optical concept of magnification with the text of the Magnificat.<sup>95</sup>

A late example of a similar association between spectacles and the Magnificat is the *Holy Family* of c.1513 by Joos van Cleve (Fig 1.16). Van Cleve painted several of these devotional Holy Family panels for the open market, four of which survive.<sup>96</sup>

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<sup>92</sup> Psalm 34 begins just after the first quarter of the page. The bird’s tail forms the capital letter of the opening word ‘Iudica’.

<sup>93</sup> “Magnify the Lord with me, Let us extol His name together”.

<sup>94</sup> “My Soul magnifies the Lord, And my spirit exults in God my Redeemer”.

<sup>95</sup> Other text-image readings have been suggested to explain the presence of the spectacles in this image. These are, however, concerned more generally with sight and eyes rather than with the concept of magnification most appropriate to both an image of spectacles and also concerns of the text itself. It has been noted, for example that Psalm 33:15 reassures the reader, “*Oculi domini super justos*” (the eyes of the Lord are on the just). Likewise, Psalm 34:19 refers to the enemies of the Psalmist “*qui oderunt me gratis et annuunt oculis*” (who hate him without cause and wink with their eyes). However, it seems clear that the eyes of this bird are not winking. Further, the image does not seem to convey the message of the text in any sense other than a somewhat arbitrary parallel with one of the many Biblical references to eyes. Neaman, 1993: 205-06.

<sup>96</sup> For van Cleve’s c.1515 panel, see Ainsworth and Christiansen, 1998: 250-52, and also Hand, 2005. All four panels are listed by M. Friedlander, 9a, 1967-76: 28-29. Only one other painting, however, has been located. This is in the Art Museum of the Ateneum, Helsinki.

In each painting the Virgin and Child (derived from van Eyck's *Lucca Madonna*) remains broadly the same, but the selection of objects in the room are different. In two versions, Joseph is pictured wearing spectacles. In the later version of c.1515 (Fig 1.17) Joseph is shown wearing a straw hat and spectacles and reading from an unidentifiable text. In the earlier c.1513 version, the artist furnishes the scene with familiar, apparently symbolic, objects (probably also derived from van Eyck's painting). On the shelf behind rests a sealed crystal carafe; just below this hangs a whisk-broom.<sup>97</sup> Among this selection of objects commonly found in Marian devotional panels – wine in a beaker, a pomegranate and a silver platter (traditionally read as symbols of Christ's Incarnation and Passion) – stands Joseph holding his spectacles. In this version, the artist has chosen to reveal the text to which Joseph had been applying his spectacles. The scroll in his hand in fact contains the final verse of the Hail Mary followed by the Magnificat:

(Et benedictus fructus ventris tui)  
Magnificat [a]n[im]a mea dominum  
Et exultavit Sp[iritu]s me  
Us in deo salutari meo  
Quia respexit humi litatem  
Ancillae suae ecce enim ex  
Hoc b[ea]tem [me dicent omnes]  
Generat [iones  
Quia] fecit mihi [magna]

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<sup>97</sup> The broom is generally read as a recognisable symbol of purity and cleanliness. The whisk-broom appears behind Mary in the Mérode altarpiece. It also appears in secular images of women, such as in the *Arnolfini Double Portrait* and Van Cleve's *Uffizi Portrait of a Woman*. The personification of Penance in Deguilleville's *Pellerinage de la ville Humaine* c.1300, holds a broom in her mouth, according to the text, "to sweep out impurities". The Dutch translation, *Boeck van den pelgherijn*, Haarlem 1486 includes a woodcut illustration of Penance with the broom. For this see Bedaux, 1986: 19.

Qui potens est et [sanctum  
Nomen] ejus Et  
[misericordia] ejus a  
[progenie in progenies  
timentibus eum].<sup>98</sup>

The artist makes explicit the content of Joseph's devotion, and furthermore establishes a firm association between Joseph's spectacles and the Magnificat text. Whilst this image dates from much later than van Eyck's painting, it demonstrates that spectacles by the sixteenth century operated within an iconography (indebted to the Eyckian tradition) employing those more obvious, and well-established symbols concerned with the central focus of the Virgin and child. Furthermore, the spectacles are, as in van Eyck's painting, in the hands of a praying figure in the presence of the Virgin and Child.

The most dominant and consistent visual tradition of representing spectacles in this period is found in images of the Virgin's Transitus. Between the last quarter of the fourteenth century and the first quarter of the sixteenth century, in excess of forty images of the Virgin's Dormition are extant from northern Europe which depict an apostle in this scene holding or wearing a pair of spectacles. Furthermore, in the period before c.1450, this is the only subject in which a continuous visual tradition of

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<sup>98</sup> From the word 'Magnificat' the text follows exactly the opening five lines of the Magnificat text in the Vulgate:

"My soul magnifies the Lord  
And my spirit exults in God my redeemer  
Because he hath regarded the low estate of his handmaiden  
For, behold, all generations shall call me blessed,  
For he that is mighty has done great things for me  
And Holy is his name..."

depicting spectacles is evident.<sup>99</sup> Throughout this period there was little change in the iconography, displaying a degree of consistency that indicates their meaning was not lost or misunderstood by frequent reproduction or replication. More importantly, the significance of spectacles within this tradition probably relates to the same Mariological concern with the Magnificat as an expression of both praise and optical magnification.

Although the earliest extant Netherlandish panel paintings of the Virgin's Dormition which employ spectacles as an iconographic device date from no earlier than the late fifteenth century, these appear to have been copied from earlier compositions. The three earliest – Berlin (late fifteenth century) (Fig 1.18), Prague (late fifteenth century) (Fig 1.19) and London (early sixteenth century) (Fig 1.20) – are closely related in composition, indicating a common compositional source (probably a drawing). The Berlin and Prague panels are attributed to a follower of Van der Goes, probably copies after a lost panel or drawing from Hugo's workshop.<sup>100</sup> The composition can therefore be dated no earlier than the 1470's. The London panel, however, although itself dating from the early sixteenth century, has been shown to have some stylistic relationship with the workshop of Robert Campin.<sup>101</sup> (Not only are the figures particularly Campinesque, the group of Christ and the angels is also very similar in reverse to God the Father accompanied by angels in the Prado *Annunciation*).

Irrespective of whether the composition originally derived from Campin (or an

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<sup>99</sup> These figures are based on a collation of the examples cited in this text and those cited in Mann, 1992 and Greeff, 1929. There are, to my knowledge, nine surviving examples of the *Death of the Virgin* with a bespectacled apostle dated before 1450. Other visual traditions appear to develop toward the end of the fifteenth century (attributing St. Jerome with spectacles most notably).

<sup>100</sup> This view is taken by Dhanens, 1998: 330-45 who proposes the panels are based on a lost panel by Hugo. See also Campbell, 1998 who suggests the Berlin and Prague panels are copies after a design prepared by Hugo when he was planning the Bruges *Death of the Virgin*. See also Winkler, 1964: 139-41 for this same attribution.

<sup>101</sup> For this proposition, see Campbell, 1998: 250-53.

early follower), the iconography certainly existed in northern European art from the late fourteenth century. Several *Death of the Virgin* panels from the Tyrol region, the earliest of which dates from 1370-72, show an apostle with spectacles. More significantly, two miniatures depicting the Virgin's death, produced around the same date in the workshop of the Bedford Master, also include an apostle with rivet spectacles. The first is the Sanctoral miniature, *Death and Assumption of the Virgin* (fol. 282v.) (Fig 1.21), which opens the Office for the Feast of the Assumption (15 August) from the *Châteauroux Breviary* (Châteauroux Bibl. Municipale ms.2), probably made for Louis of Guyenne (son of Charles V of France) c.1412-13.<sup>102</sup> The second is the opening miniature for Compline of the Virgin, *Death and Coronation of the Virgin* (fol. 89r.) (Fig 1.22) in the *Bedford Hours* (British Library Add. 18850), previously thought to have been produced c.1423,<sup>103</sup> but now thought to date from c. 1410-15.<sup>104</sup> It is quite plausible, if not likely, that van Eyck would have been familiar with the iconography of these miniatures.

In each of these Dormition images the composition is congruous: the apostles are gathered around the Virgin's deathbed, participating in the sacrament of Last Rites. In addition to the apostle with spectacles, one usually holds a lighted candle and another, dressed in a priest's alb, prepares to scatter holy water from an aspergillum. Only rarely, however, is it possible to identify any of the apostles by their usual attributes. In some examples, St. James the Great is attributed with his scallop shell and John is sometimes given a palm. However, most of the objects the apostles are given are not their own attributes but symbols of the Virgin herself, described in

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<sup>102</sup> See Villela-Petit, 2003: 19-38 and Meiss, 1968: 81-85.

<sup>103</sup> Backhouse, 1990 thought the manuscript was given to John, duke of Bedford and Anne of Burgundy by Philip the Good as a wedding gift in 1423.

<sup>104</sup> Stirnemann and Rabel, 2005 proposed the manuscript was first made for Louis of Guyenne (d. 1415) and only later personalised with the devices of the Duke of Bedford and Anne of Burgundy after their marriage in 1423. König, 2007 also takes this view.

Jacobus de Voragine's *Legenda Aurea* (*Golden Legend*). The candle, for example, refers to the words of St. Peter: "...gaude coelestium thalamorum sponsa trifidum et ardui luminis candelabrum, per quam est aeterna claritas manifestata."<sup>105</sup> Similarly, the palm John sometimes holds refers, in the words of the *Golden Legend*, to the branch given by the angel to Mary:

...dat angelus virgini bravium palmae missum ex paradisi propagine ad certitudinem adversus corruptionem mortis victoriae et vestimenta funebria ac coelum, ex quo venerat, repetit.<sup>106</sup>

It is unlikely that the spectacles were intended as an identification attribute as there is no consistency in which particular apostle is pictured using them. More likely, the explanation for the spectacles, like the other objects such as the palm and the candle, actually relate to the Virgin and the account of her death.

From the late thirteenth century on, the *Golden Legend* (written before 1264) was the principal textual source available to artists for the Virgin's transitus. This text, drawing from apocryphal, patristic, homiletic and liturgical texts (primarily composed between the fifth to the eighth centuries) "furnished a store of narrative detail and a repertory of symbolic metaphors" for artists.<sup>107</sup> The text, following the Church liturgical Feast, provides an account of the Virgin's Dormition as part of the narrative cycle of her Assumption. (There had been no liturgical Feast for the Dormition in the

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<sup>105</sup> de Voragine, *Legenda Aurea*, 119.8, 519 (hereafter cited as *LA*). "...rejoice, spouse of the heavenly bridal chamber, three-branched candelabrum of the light from on high, through whom the eternal clarity is made manifest." Translation from Ryan, 1993, 2: 91.

<sup>106</sup> De Voragine, *LA*, 119,8, 518. "...the angel gave the Virgin a palm branch sent from heaven as assurance of victory over the corruption of death, and the clothing for her burial, and then repaired to heaven whence he had come." Translation from Ryan, 1993, 2: 89-90.

<sup>107</sup> Askew, 1990: 27.



Roman calendar since the seventh century).<sup>108</sup> A number of images, likewise, combine Mary's Dormition and Assumption. Both fol.89r. of the *Bedford Hours* and fol 282v. of the *Châteauroux Breviary* show the Virgin's heavenly Coronation in the tier above the death scene below. In those images, however, that only show the Dormition, spectacles are employed exclusively in those scenes where Mary prepares for her soul to be received by Christ. (It should be noted that the term 'Death of the Virgin' is generally used, somewhat indiscriminately, for scenes at the end of Mary's life, her farewell to the apostles, lying in state, funeral and Transitus). The corresponding passage in the *Golden Legend* relates:

Sicque Mariae anima de corpore egreditur et in ulnas filii advolavit fuitque tam a dolore carnis extranea, quam a corruptione exstiterat aliena...<sup>109</sup>

In the earliest visual sources for this iconography, the artist includes a reference to this specific moment in the narrative. The panel, NG658 (Fig 1.20), probably taken from an earlier Campin-related model, shows Christ descending with the angels holding the veil upon which the Virgin's soul will be carried. Similarly, the earliest visual source for the iconography, the Tyrolean *Death of the Virgin* panel (c.1370-72) (Fig 1.23), shows Christ to the right of the Virgin's bed receiving her soul in the form of a doll-like child. (Fig 1.24 shows a detail of the apostle at the foot of the bed with spectacles). In the two Bedford miniatures, Christ is shown with the Virgin's soul in his arms. The explanation for the employment of spectacles in these images surely rests with the lines in Voragine's text immediately preceding the

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<sup>108</sup> Butler, 1926: 173.

<sup>109</sup> De Voragine, *LA*, 119,1, 507. "Then Mary's soul went forth from her body and flew to the arms of her son, and was spared all bodily pain, just as it had been innocent of all corruption..." Translation from Ryan, 1993, 2: 80.

passage cited above:

Tunc omnes qui cum Jesu venerant, dulciter intonant dicentes: haec est, quae nescivit torum in delictis, habebit fructum in refectione animarum sanctarum. Ipsa autem die semetipsa cecenit dicens: beatum me dicent omnes generationes, quia fecit mihi magna, qui potens est, et sanctum nomen ejus. Tunc cantor omnibus intonavit dicens excellentius: veni de Libano, sponsa veni de Libano, coronaberis. Et illa: ecce venio, quia in capite libri scriptum est de me, ut facerem voluntatem tuam, Deus quia exsultavit spiritus meus in te Deo salutari meo.<sup>110</sup>

The author, basing his account here on Pseudo-Dionysius's Book of the Names of God, describes how the Virgin on her deathbed sang two verses of the Magnificat just before giving up her soul to Christ. The Magnificat, although taken from the Visitation narrative in Luke I, also reasserted the role of the Virgin in Christ's birth. From a doctrinal standpoint, emphasis on the incorruptability of the Virgin's body was paramount, since a body subject to natural corruption was thought inappropriate to the bearer of the Deity. Also, according to Catholic doctrine, had the Virgin not died, a certain doubt would be cast on the truth of the Incarnation.<sup>111</sup> (It is also known that organists at St. Donatian's, and indeed elsewhere, were paid a special gratuity on the Feast of the Assumption specifically for assisting in a particularly elaborate performance of the Magnificat).<sup>112</sup>

In light of the prevalent association between not just glass forms but also

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<sup>110</sup> de Voragine, *LA*, 119,1, 507. "Then all those who had come with Jesus softly sang, 'This is she who knew no bed in sin; she shall have fruit in the visitation of holy souls'. Mary then sang about herself, saying, 'All generations shall call me blessed, because he that is mighty has done great things for me, and holy is his name'. The cantor, taking a higher pitch, intoned: 'Come from Lebanon, my spouse, come from Lebanon; thou shalt be crowned'. And Mary: 'Behold I come! In the head of the book it is written of me that I should do thy will, O God, because my spirit has rejoiced in thee, God, my saviour'." Translation from Ryan, 1993, 2: 79-80.

<sup>111</sup> For this Catholic view of the Virgin's death, see Jugie, 1949: 625-26 and Jugie, 1944: 506-25, cited by Askew 1990: 153n.

<sup>112</sup> Strohm, 1990: 31.

lenses and spectacles in Marian contexts, van Eyck would almost certainly have been familiar with at least some of the meanings and connotations I have described above. The fact that the symbolic use of glass objects in Marian images remains relatively unchanged into the sixteenth century suggests also consistency and continuity in their application throughout the period. Most commonly, spectacles in Marian contexts appear to have been used as either general symbolic references to the purity of the Virgin or more specifically to the related concept of magnification and, in particular, the Virgin's magnifying role in Christ's Incarnation. Significantly, spectacles in these earlier images tend not to suggest ideas relating to the character of the person apparently 'attributed' with them, as one might expect, but rather to the wider devotional concerns of the image.

#### 1.4.2. A Disguised Marian Symbol?

Having established a visual and textual tradition of using spectacles to refer symbolically to the Virgin and her role in Christ's Incarnation and to devotional concepts of magnification, I should like to examine how these symbolic ideas might relate to the iconographic and iconological concerns of van Eyck's *van der Paele Virgin* during the 1430s. It is therefore necessary to examine how these ideas relate to some of the other more openly symbolic objects in the painting.

Several details in the painting recall references to death and resurrection which, especially given the context of the panel's original primary function as a memorial panel,<sup>113</sup> would probably have been open to early viewers. The depicted

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<sup>113</sup> Van der Paele probably commissioned the painting in 1434 when he began to make other preparations for his tomb in the chapel of Sts. Peter and Paul and founded a chaplaincy for care of his tomb and recitation of prayers at his grave. Viaene, 1965: 260. For an alternative view of the panel as an altarpiece, see Friedländer, 1967, 1: 42-43.

setting, which appears to be centrally-planned (as opposed to an apse),<sup>114</sup> clearly recalls early Christian funerary architecture,<sup>115</sup> and may have been intended as a specific reference to the Holy Sepulchre, the site of Christ's death and burial. Most parishioners would also have been aware of Donatian's life which echoed Christ's own death and resurrection. (Donatian's wheel of candles refers to the one thrown into the Tiber after he was feared drowned. The wheel came to rest over his body and he was brought back to life). To some viewers the carved throne sculptures of Cain killing Abel and Samson and the Lion may have been recognisable as prefigurations of Christ's death and the Harrowing of Hell.<sup>116</sup> In a similar fashion, it has been argued that the carved scenes on the capitals of the columns and piers in the background also feature common prefigurations of Christ's death on the left side and his resurrection on the right (although these would have been visually and intellectually open to a limited audience).<sup>117</sup>

By positioning the Virgin as the devotional centre of wider concerns with Christ's sacrificial death, the viewer is invited to consider her role in Man's salvation through Christ. However, within the wider image, the compositional and devotional focus of the enthroned Virgin and Child is unified in its exclusive concern with Marian and Incarnational symbols. The altar-like lap of the Virgin and the way in which Christ is held above a white cloth must have recalled the Eucharistic significance of Christ's body.<sup>118</sup> The objects held by Christ and the Virgin (Fig 1.25) would also have been quite openly recognisable as symbols. The red flowers held by

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<sup>114</sup> The angles of the nearest column base to the right and the abaci of the two column capitals to the left indicate that the nearest columns are outward-facing and that the structure is dodecagonal.

<sup>115</sup> The general resemblance to Santa Costanza is perhaps the most striking comparison.

<sup>116</sup> They are described in the *Biblia Pauperum* and *Speculum Humanae Salvationis*, for example. See Naftulin, 1971: 7.

<sup>117</sup> Naftulin, 1971: 4, 7, and Purtle, 1982: 94-95.

<sup>118</sup> Lane, 1984: 17-18.

Christ and the Virgin are (single) carnations (*dianthus ceryophyllus*) which, at this time, were known as 'nagelbloem' (nail flower) because they resembled the top of a medieval nail (which had serrated edges).<sup>119</sup> Many viewers would, therefore, have recognised a popular symbolic reference to the Passion and the nails of the Crucifixion. The white flowers are more difficult to identify, but they are most likely jasmine – a flower symbolically associated with the Virgin's purity.<sup>120</sup> The fact that Mary is contemplating her own role in her son's redemptive death is suggested by the tears running down her right cheek.<sup>121</sup> The parrot, held by Christ, is also likely to have been familiar to many viewers as a symbolic device. The parrot was commonly thought to greet people with the word "Ave", recalling Gabriel's words at the Annunciation, *Ave Maria Gratia Plena*.<sup>122</sup> Following this belief, Franciscus de Retza in his *Defensorum inviolatae virginitatis Mariae* asked "If a parrot has the power from nature to say Ave, why might not a pure virgin conceive through (the word) Ave?"<sup>123</sup> Although van Eyck is not likely to have known this rather obscure text, the association between the parrot and the word "Ave" must have been understood as a symbolic reference to the Annunciation.

Van der Paele's spectacles are visually less conspicuous than the parrot and flowers and are unlikely to have been so easily recognisable as symbolic objects.

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<sup>119</sup> The symbolism of the dianthus is discussed by Koch, 1964: 73 in relation to the *Portinari Altarpiece*. The red dianthus is also represented on Gabriel's cope in the Washington *Annunciation*.

<sup>120</sup> See D'Ancona, 1977: 193, for the Marian symbolism of jasmine. I am not aware of any study that has successfully identified the flowers in the *van der Paele Virgin*. Ward, 1994: 24 identified them as members of the mustard family, whose Latin name is *Cruciferae*. There are, however, two different kinds of flower in the bouquet, and mustard flowers have rounded petals whereas the petals of the red flowers in the painting have serrated edges and the petals of the white flowers have pointed ends. He also suggests the three different coloured flowers – red, white and blue – represent the virtues. There are, however, no blue flowers in the arrangement.

<sup>121</sup> This is clearly visible on close inspection of the panel. This detail seems to have remained unnoticed by scholarship to date.

<sup>122</sup> Naftulin, 1971 deals with the symbolism of the parrot and the idea that parrots said 'Ave'. He cites examples from Isidore of Seville, *Etymologies* (12, 7:24) and Konrad von Megenberg, *Das Buch der Natur* as well as the Franciscus de Retza text.

<sup>123</sup> Naftulin, 1971: 8.

However, their compositional placement alongside the more 'open' (Marian) symbols I have just described would certainly have allowed them to operate symbolically, or allusively, as attributes of the Virgin or as references to the mystery of the Virgin birth. Following the traditions outlined above, their material property as glass lenses might have recalled the popular topos of light passing through glass or one of the many specular metaphors which compared the brightness or brilliance of the Virgin with glass objects. Indeed, the optical imagery of the inscription around the frame encourages this kind of interpretation:

HEC E[ST] SPECIOSOR SOLE SUP[ER] O[MN]EM STELLARU[M]  
DISPOSIC[I]O[N]EM LUCI C[OM]PA[RA]TA I[N]VE[N]ITUR P[RI]OR  
CA[N]DOR E[ST] ENI[M] LUCIS ETERNE SPEC[U]L[U]M S[I]N[E]  
MAC[U]LA D[E]I MAIES[TATIS].<sup>124</sup>

Although the passage is taken from Wisdom 7:26, it would have been familiar from its place in the Liturgy for the Feast of the Virgin's Assumption on 15 August.<sup>125</sup> In the context of van Eyck's paintings, the inscription must surely refer to the Virgin herself (although there is also an ambiguous suggestion that the panel is itself a kind of spotless mirror, as I will discuss later in the chapter).

As van der Paele holds his spectacles over his book, there is a suggested visual relationship between reading and the use of lenses for magnifying text. Van Eyck's inclination to employ clever word-play supports the suggestion that the spectacles were intended to refer to concepts of magnification and especially the dual optical and

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<sup>124</sup> "For she is more beautiful than the sun, and above all the orders of stars; being compared with the light, she is found before it. She is the brightness of the everlasting light, the unspotted mirror of the power of God." Dhanens, 1980: 218 and 383.

<sup>125</sup> Weale, 1912: 123 was the first to recognise that the passage is also found at Lauds of the Assumption.

devotional meanings of the word 'magnify'. By holding his spectacles over his book, van der Paele quite literally 'magnifies the Word'. The combination of the book and the spectacles may, therefore, recall the liturgical appellation of Jesus referred to in the Gospel of St. John as "The Word". The title derives its significance from St. John's only description of the mystery of the Incarnation (John 1:14), which was repeated at every Mass, "Verbum caro factum est" (The Word was made flesh). Although van Eyck does not literally represent the magnification of the text under the lens, the common association between spectacles and the enlargement of text would have been recognisable to viewers. The fact that the text in van der Paele's book is not legible perhaps suggests that we are supposed to understand this particular detail simply as 'words'. It is also possible that van Eyck's decision not to describe the words of the text reflects his tendency to make allowance for what viewers who saw the panel in its original location were physically able to see. (I will address this issue in more detail in Chapter IV).

In the context of the wider iconography and its concern with the Incarnational relationship between Christ and his Mother, it seems quite plausible that van Eyck should have included the spectacles as a reference to the Virgin's magnifying role in Christ's Incarnation. Alongside the parrot and the flowers, the viewer is able to draw on a range of symbolic ideas associated with these objects. Although these ideas do not appear to constitute a complex iconographic programme, they reflect a consistent concern with emphasising the Virgin's role in the Incarnation, within the wider context of Christ's redemptive death.

The Magnificat text, furthermore, had a particularly favoured position in the devotional life of St. Donatian's and in the personal devotional concerns of the Canon himself: in addition to its regular place at the end of Vespers, the Magnificat was also sung each Sunday and on Feast days. Following the choral foundation of 1421

(whereby a polyphonic Mass in honour of the Virgin was sung each day), the Magnificat attracted by far the greatest number of settings with the single exception of the Mass itself.<sup>126</sup> As a canon of the church, van der Paele would have regularly recited and probably sung this particular text more frequently than any other. The most elaborate setting of the Magnificat was a performance 'in discantu de O Christi pietas' whereby the cantores would sing two halves of the antiphon 'O Christi Pietas' alternately after each verse of the Magnificat. (This was apparently the favoured manner of setting the text for the most important feast day in the liturgical calendar, St. Donatian's feast day on 14 October).<sup>127</sup> Significantly, van der Paele's deceased brother, Judocus, a former Canon of the church (mentioned in Joris's 1441 foundation), had endowed this same Marian antiphon in 1401.<sup>128</sup> For van der Paele, the Magnificat might, therefore, have had some personal resonance.

### **1.5. Analysis: Towards a Visual Assessment of van Eyck's Specular Symbolism**

There is apparently sound reason, therefore, to suggest that van der Paele's spectacles were intended as symbolic references to the Virgin and perhaps specifically to a dual understanding of magnification. There was a well-established textual and visual tradition of their symbolic use; their connotations with Christ's Incarnation are central to the more 'open' concerns of van Eyck's painting; and the patron's position as a Canon of the church even suggests a familial resonance with the symbolic allusions this object suggests. Also, the symbolic use of spectacles as references to the Magnificat in *Death of the Virgin* images was probably familiar to van Eyck through

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<sup>126</sup> A list of one-hundred-and-fifty new polyphonic compositions from the fifteenth century included ninety-one Masses and thirty-six Magnificats, in contrast to only twelve Te Deums. In 1468-69 more Magnificat settings were composed than Masses (eighteen versus sixteen). Strohm, 1990: 30.

<sup>127</sup> Strohm, 1994: 35.

<sup>128</sup> Strohm, 1994: 35.



manuscript images such as those from the Bedford Master's workshop and possibly also panel paintings from the circle of Robert Campin.

This symbolic interpretation of van der Paele's spectacles, however, also presents a number of problems. First, the nature of the visual tradition I have identified is not an exact precedent for van Eyck's donor image. Whereas most of the visual examples I cite as part of a continuing visual tradition are either *Death of the Virgin* images or *Holy Family* images, none depict a donor participating so directly in the devotional concerns of the panel. As there are no comparable earlier images of donors depicted with spectacles, it is impossible to establish a more precise existing visual tradition. The visual tradition is therefore related to van Eyck's painting, but cannot be considered a direct precedent, and it cannot be assumed that the significance of the spectacles remains the same in each context.

A further problem is the association I have suggested between magnification and the Magnificat. Whilst there is sufficient evidence to suggest that a metaphorical association was understood in certain manuscript images, panel paintings, and sculpture, it is surprising that there are, to my knowledge, no painted examples from northern Europe of this iconography in a *Visitation* image (although the sculpted statuette of the Virgin with the crystal cabochon cited earlier in the chapter (Fig 1.13) is, of course, part of a Visitation scene).<sup>129</sup> A partial explanation for this might be that compared with other Marian subjects such as the *Annunciation* and even the *Death of the Virgin*, the *Visitation* was a far less popular subject, especially for panel paintings. Also, this particular subject does not offer the same opportunity to include a figure with spectacles as, for example, *Death of the Virgin* images present, with the apostle reading his book. Nevertheless, without further examples of this tradition in *Visitation*

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<sup>129</sup> Also, a more comprehensive, systematic search of unpublished manuscript images than time allowed me to carry out might reveal further examples.

images, this particular argument remains speculative.

The most problematic aspect of this symbolic reading, however, derives from the somewhat restrictive way in which this approach assigns rigidly symbolic or non-symbolic status to objects, according to how firmly a given idea can be demonstrated to have been recognisable to early viewers. This approach sits uncomfortably with how van Eyck's paintings describe and reveal such potentially symbolic objects to the viewer. Whereas the difficulty in firmly categorising objects as 'symbolic' or 'non-symbolic' tends to be seen as a methodological weakness, the visual concerns of van Eyck's paintings, as I will demonstrate, suggest that this ambiguity was quite intentional. (Panofsky's suggestion that van Eyck used 'disguised symbols' goes some way to accounting for such an ambiguity, but the nature of this disguise tends to be understood somewhat narrowly).

A good example of the symbolic ambiguity in van Eyck's painting are the flowers, which openly invite speculation as to why Mary and Christ are holding them. One explanation, as I suggested above, is that viewers were expected to recognise the flowers, and perhaps even their common and/or Latin names, in order to make a symbolic (textual) association with Christ's death and Mary's purity. Alternatively, we might understand the flowers more generally as a sign of 'betrothal' (carnations are commonly shown as tokens of betrothal between lovers in medieval images),<sup>130</sup> suggesting a correlation between the Virgin and the Bride from the Song of Songs.<sup>131</sup> Although several possible meanings are open to the viewer, the visual prominence of the flowers and their obvious association with Mary and Christ indicates that a

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<sup>130</sup> Mercier, 1937: 233.

<sup>131</sup> Purtle, 1982: 8-10, 92 points out that the *Little Office of the Blessed Virgin Mary* (from which van Eyck probably took some of his inscriptions) draws heavily on imagery from the Cantic of Canticles. She also suggests that the wedding band on Mary's finger reinforces the Incarnational relationship between Christ and His Mother.

symbolic interpretation of some kind is expected. There are, however, flowers elsewhere in the painting which are not so immediately obvious: The carpet under the Virgin's throne and the lampas silk baldachin suspended behind it both contain flowers (roses) which repeat the dominant colour combination of red, green and white.<sup>132</sup> The combination of red and white roses is suggestive of the popular medieval idea of the Virgin as an enclosed garden and as the 'rose without thorns' (red denoting the Passion and white her purity). The ruby surrounded by pearls on the front of Mary's crown provides an even subtler echo of the flower motif. More important than the potential symbolic meanings these flowers might suggest is the way in which van Eyck repeats this same motif in increasingly subtle ways, which only become apparent with considered or prolonged observation. To separate which of these are 'symbolic' or 'disguised' or 'open' seems to act counter to the more fluid way in which these visual echoes were designed to be perceived.

This use of fluid or ambiguous symbolism is even more pronounced in van Eyck's depictions of specular (glass and metallic) objects in his Marian paintings. As I suggested earlier in the chapter, what distinguishes van Eyck's paintings from works by his contemporaries is the way in which specular objects and materials are used, and descriptions of light are so carefully articulated that the optical-specular character of the work cannot be separated from our attempt to read these objects as symbols. All of van Eyck's paintings demonstrate a fascination with the refraction and reflection of light, but the profusion of metallic and glass objects in his Marian paintings still tend to be understood according to the strictly symbolic meanings associated with them. Arguably, these objects are also suggestive of van Eyck's concerns as an artist and, in this respect, they point to a correspondence between his visual interests and the

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<sup>132</sup> Monnas, 2000: 155

iconographic concerns of the subject. What seems particularly striking is how van Eyck manipulated this interest in describing light with an existing tradition of optical and specular metaphors relating to the Virgin.

Although van Eyck's paintings contain a similar range of objects to those found in Marian paintings by Campin and van der Weyden, van Eyck's paintings are far more extensively and consistently concerned with optical metaphor. In particular, van Eyck's Marian paintings seem overtly concerned with describing light passing through glass as an allusive or symbolic reference to this established Incarnation topos. Some paintings make this idea quite explicit by showing a gilded ray passing through a window pane (the Washington *Annunciation*, for example) or dappled sunlight streaming through church windows onto the floor inside (the Berlin *Virgin in a Church* (Fig 1.11)). Others use a glass carafe, prominently placed in sunlight (the Ghent Altarpiece *Annunciation* (Fig 1.12) and *Lucca Madonna* (Fig 1.1), for example). Although slightly less obvious, the light passing through the panes of bull's-eye glass in most of these Marian paintings (including the *Lucca Madonna*, *Virgin and Child with the Canon van der Paele*, *Rolin Virgin*, *Dresden Triptych*) also encourages the viewer to understand the room itself, and the light entering it, in similar Incarnational terms. There is, in other words, no separation between obvious or open references to this concept and less obvious references. Likewise, there is no clear separation between the objects that allude to this symbolic idea and the materials they are made from, the optical effects they produce and the way they are described. In the *Lucca Madonna*, for example, the glass carafe is suggestive of the light through glass Incarnation topos and the brass basin is suggestive of the 'speculum immaculatum' epithet. These more obviously symbolic descriptions of glass and metallic objects are accompanied by multiple examples of similar specular descriptions, such as transmitted and reflected light through the bull's-eye glass panes

and gemstones and reflected light on the lions, the gold threads and the pearls. Consequently, it is very difficult to separate symbols that refer to specular metaphors from straightforward naturalistic descriptions of light. Far from inviting the viewer to make such distinctions, the painting actively works against this kind of response.

Symbolic ambiguity in van Eyck's work is not, however, simply derived from the objects they depict, but is also a matter of style and technique. In order to describe the transmission, refraction and reflection of light, his paintings themselves rely on these same optical principles. Using layers of variably translucent paint over a reflective ground, the paintings actually manipulate real light to produce sensations of differing luminance. (I will discuss this aspect of van Eyck's paintings in Chapter III). As well as describing effects of light, van Eyck's paintings, therefore, often re-create them, further preventing the viewer from separating optical metaphor from the optical concerns of the style and technique. The suggestion that van Eyck was aware of this ambiguity is perhaps indicated by the placement of the 'speculum immaculatum' inscription on the van der Paele painting around the frame, which ambiguously suggests that the painting is itself a kind of 'spotless mirror'.<sup>133</sup>

The spectacles in the van der Paele panel, I would argue, are a typical example of the symbolically allusive specular objects that distinguish van Eyck's Marian paintings. The failure to firmly ascribe a single symbolic or non-symbolic meaning to them is not, I suggest, a failure of methodology or its application, but indicative of how these objects were intended to function. The van der Paele panel is filled with subtle allusive descriptions of light which collectively contribute to the Incarnational focus of the painting. The inscription around the frame makes explicit the optical-specular language of the painted description, describing the brightness and mirror-like

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<sup>133</sup> Other scholars, such as Hamburger, 2000a: 50-51, have commented on the ambiguity of the inscription.

nature of the Virgin (and ambiguously the painting itself). The mirror reference is echoed visually in the crystal on Donatian's processional cross (Fig 1.26), which reflects the space in front of the panel, and in St. George's armour in which a reflection of the Virgin and Child is depicted in several places, most notably on his helmet (Fig 1.27). (The reflection of the artist in George's shield (Fig 1.28) also suggests a play on the idea of the panel as a kind of mirror, as the Middle Dutch word *schild* meant both shield and panel).<sup>134</sup> Likewise, the brightness and spotlessness of the Virgin is suggested visually by the bull's-eye glass windows, the translucent gemstones (most notably on Donatian's mose and mitre), and van der Paele's spectacles (which have a strong visual connection with the circular bull's-eye panes of glass). The windows that punctuate the dark space also not only suggest the idea of light passing through glass but actually recreate this sensation optically. Although this suggestion is quite subtly allusive here, the more explicit use of this symbol in van Eyck's other Marian paintings (such as the *Lucca Madonna* and *Virgin in a Church*) indicates that this suggestion was quite intentional.

I suggest, therefore, that the Canon's spectacles function primarily at an allusive symbolic level (by which I mean intentionally open to a range of existing symbolic ideas) as part of the wider optical-specular language of van Eyck's Marian works. The decision to include them in the painting reflects both the Marian focus of the Canon's devotion and also van Eyck's own interest in describing specular materials in his paintings. His Marian works are filled with specular objects and striking descriptions of light which encourage the viewer to visualise (established) devotional ideas about the Virgin which use the same optical language. Along with the other specular objects in the painting, van der Paele's spectacles suggest both general and specific ideas about the Virgin. Given the panel's concern with optical

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<sup>134</sup> The significance of the word 'schild' was first pointed out by Preimesberger, 1991: 483-85.

symbolism and allusion, it seems more than likely that the spectacles were intended to allude both to the Incarnational topos of light passing through glass and also to the dual meaning of 'magnification'. Certainly not all early viewers would have understood these specific symbolic references, but most would undoubtedly have made both conscious and unconscious connections between familiar and popular optical metaphors and similes of the Virgin (not least the one inscribed on the frame) and the profusion of these same ideas described visually in the painting.

The optical concerns of van Eyck's style and technique, I suggest, influenced his selection of depicted objects and materials and the way in which these objects operate symbolically (or allusively). Rather than seeing the naturalistic style of van Eyck's paintings as the product of a desire to disguise each object and surface with hidden meaning, I would argue that the most distinctive aspect of his approach to symbolism was, in fact, strongly influenced by the optical concerns of his painting practice. Furthermore, the idea that symbols are 'disguised' by an ostensible naturalism is also problematic: naturalism, as I have suggested, often controls, reveals and reinforces objects which allude to symbolic ideas. Far from being 'disguised' symbols, van der Paele's spectacles are very much concerned with articulating the recognition of symbolic meaning in primarily visual terms.

Despite my reservations concerning 'disguised symbolism', however, the suggestion that van der Paele's spectacles were intended to allude to primarily Marian optical metaphors, similes and word-plays is, I believe, convincing. This argument, however, rests on a more careful consideration of the visual concerns of van Eyck's work than Panofsky's approach requires. Van Eyck's practice, as the following chapters will show, was entirely dominated by the description of light and its image-making capacity. His paintings also display a fascination with processes of optical enhancement in relation to the perception of space and detail (including magnifying

lenses). It seems unlikely that van Eyck would not have been sensitive to a range of allusive and symbolic meanings associated with the optical effects his paintings are so concerned with describing.

Whilst the iconographic method suggests that optical description has a symbolic value in van Eyck's paintings, there is no reason to suppose that such description was necessarily dictated by purely symbolic ends. I would suggest, rather, that the symbolic ideas associated with reflective and refractive objects, such as the Canon's spectacles, were also controlled by the visual concerns of van Eyck's practice. The remainder of this thesis, therefore, will argue that, in the case of van Eyck, the 'personal tendencies of the master' are distinguished by a comprehensive concern with the visual potential of optical concepts – such as magnification and reflection – and the devices that produced them. As Otto Pächt stated in his 1956 review of Panofsky's *Early Netherlandish Painting*, stylistic and visual analysis must always "have the last word".<sup>135</sup>

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<sup>135</sup> Pächt, 1956: 276.



## **CHAPTER II**

### **CONVEX MIRRORS AND THE SPATIAL CONCERNS OF VAN EYCK'S PAINTINGS**

## 2.1. Introduction

Van Eyck was evidently fascinated with how reflected images might be used to convey not only symbolic ideas, but also spatial concepts. His paintings describe reflections in order to clarify or emphasise relationships between depicted objects, and/or to suggest visual and conceptual relationships between the painted image and the space of the viewer or painter. The *Arnolfini Double Portrait* (Fig 1.3), for example, uses the convex mirror to 'reflect' the space implicitly in front of the panel. In 'symbolic' terms this reflection may refer to the depicted couple's interests or identity, but it also has an important spatial function: it augments our view of the depicted space, showing the figures and objects from behind as well as parts of the room outside the panel's visual field. Furthermore, its wide-angle distortions (Fig 0.3) encourage the viewer to compare the reflected image with the 'direct image' in front of it.<sup>1</sup>

Although the symbolic and spatial functions of the Arnolfini mirror tend to be read in relation to the iconography of the painting,<sup>2</sup> this motif is also indicative of a broader concern of van Eyck's with reflection, and in particular the images produced by convex mirrors. In addition to the *Arnolfini Double Portrait*, two other panels associated with van Eyck also apparently used convex mirrors to show different 'views' of form and space simultaneously. One of these – a lost *Woman Bathing*, described by Fazio, which probably resembled the sixteenth-century *Woman at her Toilet* now in the Fogg Art Museum (Fig 2.1) – included a mirror on the wall which reflected the woman's body from behind.<sup>3</sup> Another lost painting depicted an Italian

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<sup>1</sup> These various visual relationships are analysed in detail by Yiu, 2001: 133-210 who suggests that this visual comparison verifies the 'reality' of the pictorial space, thereby making it seem more real.

<sup>2</sup> See, for example, Belting and Kruse, 1994: 74-79, Yiu, 2001 and Baldwin, 1984.

<sup>3</sup> Fazio, *De Viris*: 102-03. See also Introduction, n. 2 above. On the Eyckian Fogg panel, see Held, 1957 and Hensick, 2003, who suggests a *terminus post quem* of 1511 based on dendrochronology.

merchant making up his accounts with his patron.<sup>4</sup> Based on surviving paintings which appear to have derived from van Eyck's composition, such as Quinten Massys's *The Banker and his Wife* (1514) (Fig 2.2), it appears that a convex mirror was probably included in the foreground, 'reflecting' the space in front of the panel. In each of these examples, the mirrors play on the restrictions of a fixed viewpoint and the visual possibilities of reflected images.

The accuracy with which van Eyck painted reflected images in his paintings also suggests that he understood, either by practice or theory, the properties of mirror reflections. One recent study has suggested that van Eyck must have based the reflected image in the Arnolfini mirror on a real example, observed from life.<sup>5</sup> Another study suggests that he must have understood the principles of optics and catoptrics (the formation of images by reflection) well enough to (re-)create accurate painted reflections, such as those in St. George's armour on the *van der Paele Virgin* (Figs 1.27 and 1.28).<sup>6</sup> As most objects in his paintings are either entirely imaginary or, more usually, adapted to meet specific symbolic or compositional requirements, the latter explanation seems more likely. This knowledge, however, must also have been based, to a certain extent, on practical experience with mirrors and reflected images.

Van Eyck's apparent understanding of optics and catoptrics has important implications regarding the visual concerns of his practice. Beyond using representations of optical effects to suggest symbolic, conceptual and spatial ideas, his engagement with reflected images, and the devices that generate them, as I will argue,

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<sup>4</sup> The panel was described by Marcantonio Michiel, *Notizia d'Opere del Disegno*, 54, as "El quadretto a meze figure, del patron che fa conto cun el fattor fo de man Zuan Heic, credo Memlino Potentino, fatto nel 1440" (A picture of half-length figures, the patron making up his accounts with his agent done by van Eyck, [who] I believe [was called] Memling, in the year 1440). Dhanens, 1980: 307-09 argues Michiel probably copied his information from an inscription on the panel.

<sup>5</sup> Crimsini, Kemp and Kang, 2004.

<sup>6</sup> Preimesberger, 1991.

also informed how the paintings themselves were conceived – both materially and intellectually. This chapter analyses two of van Eyck's paintings – the *Virgin and Child with the Chancellor Nicolas Rolin* and the *Washington Annunciation* – to examine how his experience with convex mirrors informed the spatial construction of his paintings. The analysis is concerned with two issues in particular: whether van Eyck used a mirror as a practical tool in the process of painting; and the extent to which his conception of spatial representation was informed by his knowledge of the visual distortions and enhancements of reflected images.

Most of this chapter is necessarily concerned with establishing specific formal connections between convex mirror reflections and the spatial character of van Eyck's paintings. This analysis forms the foundation for Chapters III and IV which investigate further how these concerns were part of a more comprehensive interest in using lenses and mirrors to interpret and mediate ordinary visual experience and, ultimately, to shape his painting practice.

The first section (2.2) will look at the limited visual and textual evidence for the use of convex mirrors as workshop tools in the fifteenth century. Following this, the body of the chapter (sections 2.3 and 2.4) comprises detailed visual analyses of the two paintings.

## **2.2. Contextual Evidence: The Convex Mirror as a Tool of the Artist's Workshop**

In 1959, Heinrich Schwarz suggested in his article 'The Mirror of the Artist and the Mirror of the Devout'<sup>7</sup> that Early Netherlandish panel paintings of the

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<sup>7</sup> Schwarz, 1959.

fifteenth century often resemble mirror images because they were painted with the aid of a convex mirror.<sup>8</sup> Schwarz cites the example of the small Naples panel, *Holy Family with Saint Catherine of Alexandria and Saint Barbara* (c.1440-45) (Fig 2.3), by an unknown painter working in the style of Konrad Witz in which he identifies “strange curvatures of the pillars and vaulting”.<sup>9</sup> He goes on to suggest that such curvatures might be explained in relation to the artist’s use of a convex mirror. Although Schwarz does not justify his claim with detailed visual analysis of the “eccentric perspective”, he backs up his claim with evidence from numerous paintings of *Saint Luke Painting the Virgin* in which convex mirrors feature apparently as part of the equipment of the artist’s workshop.<sup>10</sup>

### *Visual Sources*

Images of Saint Luke are commonly used as pictorial sources for the practices and equipment of a fifteenth-century workshop.<sup>11</sup> As a number of scholars have pointed out, however, it is particularly difficult to untangle, in these images, ‘disguised’ symbolic objects from objects deriving their placement from the desire for realism. In Colyn de Coter’s *Saint Luke* (c.1493) (Fig 2.4), generally thought to derive from a lost painting by Robert Campin,<sup>12</sup> for example, the mirror, which hangs on the far wall beside the door, could be interpreted as a symbolic reference to the Virgin as the ‘speculum sine macula’. Considering the evidence outlined in Chapter I of a strong metaphorical relationship between glass, lenses, mirrors and the Virgin, this

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<sup>8</sup> Schwarz, 1959 whose argument is repeatedly cited in the literature to support passing suggestions that artists used mirrors as tools at this time. A recent example is Hamburger, 2000b: 396 who describes mirrors as “essential tools of their craft”. He does not suggest exactly how artists might have used them.

<sup>9</sup> Schwarz, 1959: 93.

<sup>10</sup> Schwarz, 1959: 93-94.

<sup>11</sup> For example, Campbell, 1997: 12-14.

<sup>12</sup> Klein, 1933: 40 and Panofsky, 1953: 175.

object is likely to have been interpreted, at least by some viewers, in these symbolic terms. However, as Till-Holcher Borchert has noted, the 'spatial proximity' of the mirror to the painter's instruments directly below suggests the association is primarily with the artist, as opposed to the Virgin.<sup>13</sup> As the mirror features only in images depicting Saint Luke painting the Virgin, and not as a general attribute of the Saint, it seems likely that the mirror refers either to the painter or the practice of painting. On these grounds, scholars have suggested that the mirrors were intended as metaphorical references to mimetic painting, referring to the painter's ability to reproduce nature faithfully, or with accuracy on both large and small scales.<sup>14</sup> Irrespective of whether the mirrors carried symbolic meaning, however, their presence relies on a certain level of visual plausibility that one might expect to find a mirror in an artist's workshop at this time.

Exactly how artists used the mirrors is also very difficult to assess on the basis of these paintings. In most cases they are hung in or near a window or door, usually on the window frame or mullion. In some examples, such as the *Saint Luke Painting the Virgin and Child* attributed to Quinten Massys or a follower (c.1530) (Fig 2.5), the artist sits directly in front of the mirror, perhaps using it to reflect light on to his workspace. If artists made use of convex mirrors as tools of their craft, these paintings do not illustrate how they might have used them. In fact, in most images the mirror is evidently not being used by the artist in any practical way. Rather, its presence appears to be one of association,<sup>15</sup> either as an attribute of the painter or his workshop, or as an allusive reference to the act of painting.

Another context in which a convex mirror features as part of the artist's atelier

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<sup>13</sup> Borchert, 1998: 74.

<sup>14</sup> Belting and Kruse, 1994: 74-79, Yiu, 2005: 486-88 and also Hamburger, 2000b: 396.

<sup>15</sup> Yiu, 2005: 478-85.

is in manuscript images accompanying Boccaccio's *De Claris Mulieribus* (written 1361-62 and translated into French in 1401) in which the paintress Marcia is shown painting her self-portrait from a convex mirror.<sup>16</sup> (Fig 2.6 shows a miniature of Marcia from the French Mostyn manuscript, c.1475). In this case, the mirror has a literary source – Pliny specifically mentions that Iaia (whom Boccaccio called Marcia) painted her self-portrait with the aid of a mirror.<sup>17</sup> This does not, however, preclude the mirror from also being a familiar tool of the fifteenth-century artists' workshop, as other contemporary practices and equipment are often shown in detail in these miniatures.<sup>18</sup>

Neither images of Marcia nor those of Saint Luke, therefore, can be understood as 'illustrations' of contemporary working practices. More likely, as scholars have argued, the mirrors refer primarily to ideas associated with the artist and his/her painting. By including convex mirrors in their paintings, artists could demonstrate their artistic skill. More specifically, in many of these images there appears to be an equation between the reflected image, the painted image and the act of painting. Far from denying a relationship between mirrors and contemporary working practices, however, the symbolic ideas to which these paintings allude seem to actively promote both literal and conceptual connections. In particular, they allude to the metaphor of painting – perhaps specifically the ability to produce 'reflections' of reality on a reduced, or miniaturised scale - but simultaneously they function as literal demonstrations of the artist's facility for producing naturalistic 'mirror-like' images.

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<sup>16</sup> Further examples are shown in Borchert, 1997: 67-68, including one in a manuscript made for Philip the Bold (Paris Bibl. Nationale, Ms. Fr. 12420, fol. 101v.)

<sup>17</sup> Pliny, *Naturalis Historia*, xxxv, 147, cited in Borchert, 1997: 74.

<sup>18</sup> Borchert, 1997: 66 who also suggests that images of Saint Luke provided pictorial sources for some miniatures of Marcia.

## *Textual Sources*

Unfortunately, as northern Europe did not develop a mode of critical discourse equivalent to the one in contemporary Italy, the surviving written record includes no reference to how fifteenth-century artists might have used mirrors and lenses as workshop tools. The example of Italy (in particular Florence) at this time is, however, instructive in the absence of Northern documentary sources on painting practice. Whilst it is misleading to transpose the specific concerns of Italian artists onto the practice of Netherlandish artists, some texts suggest that mirrors were considered useful by Italian artists as a means of visualising, or even verifying the recession of space and also as a means of refining or adjusting aspects of finished paintings. Given how often they appear in Northern paintings, it is reasonable to suppose that mirrors might have been used for similar purposes by artists north of the Alps also.

A first example is taken from Antonino di Tuccio Manetti's well-known 1485 account of Brunelleschi's perspective demonstration at the Baptistery of San Giovanni in the 1420s.<sup>19</sup> According to this account, the artist demonstrated the veracity of his finished painted panel via an in situ comparison between the real Bapsistery and a mirror reflection of his painting (viewed through a peep-hole at the vanishing point in the panel). What is infrequently stressed in the retelling of this account is that, before his public demonstration, the artist must used a mirror in order to paint his panel.<sup>20</sup> Unfortunately, Manetti's retrospective account says nothing of how the artist painted his panel prior to the demonstration. We can, however, be confident in stating that as

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<sup>19</sup> Manetti, *Vita di Filippo Brunelleschi* (hereafter cited as *VB*).

<sup>20</sup> This view is advocated by Krautheimer, 1956: 243ff. Gioseffi, 1957: 78ff takes a similar view, proposing that Brunelleschi copied the painting from a mirror placed at an oblique angle so as to avoid his own reflection. Kemp, 1978: 148-49, rules out the idea that the artist might have copied directly from a mirror reflection, citing the obstruction of the artist's own reflection as a principal problem. I do not believe the problem would have been as great as Kemp suggests however. Tsuji, 1990: 276-92 makes a case for the camera obscura which, although possible, is rendered unlikely by the lack of evidence supporting its early use.



a means of producing a reversed image suitable for the demonstration, it is most likely that the artist had, by some means, copied or transferred a mirror image of the reflected building on to an adjacent panel. It is interesting to note also that, according to Manetti, Brunelleschi's panel was only "circa mezzo braccio quadro"<sup>21</sup> (about 29cm square), and he goes on to say that it was "fatto con tanta diligenza e gentilezza e tanto apunto co colori de marmi bianchi et neri, che non è miniatore che l'avessi fatto meglio".<sup>22</sup> In the single known example where a mirror is associated with the production of a panel painting, therefore, the traits ascribed to the panel are a miniaturist style and unusually small scale – the same traits commonly identified in Netherlandish panel paintings, most commonly in the work of van Eyck.

In another example, from a treatise written twenty-five years before Manetti's account, Filarete recounts how Brunelleschi discovered his system of perspective by looking at the properties of mirror reflections:

...e così credo che Pippo de Ser Brunellesco fiorentino trovasse il modo di fare questo piano che veramente fu una sottile e bella cosa; per ragione trovasse quello, che nello specchio ti si dimostra...<sup>23</sup>

Filarete goes on to describe how the artist might employ a mirror as an aid to envisioning the diminution of subjects more easily:

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<sup>21</sup> Manetti, *VB*, 42-43. "About half a Braccio square". It has been suggested that Manetti was referring to the *area* of the panel, in which case the panel could be as long as 41cm. For this, see Kemp, 1978: 137. Even if Kemp is correct, the panel is still unusually small.

<sup>22</sup> Manetti, *VB*, 42-43. "Done with such care and delicacy, and with such accuracy in the colours of white and black marbles, that there is not a miniaturist who could have done it better".

<sup>23</sup> Filarete, *Trattato di architettura*, 23, 178r. (hereafter cited as *Trattato di arch*). "...and so I believe that Pippo di Ser Brunellesco the Florentine found the way to make this plan which truly was a subtle and beautiful thing, which he discovered considering what a mirror shows to you..." Original text from Spencer, 1966, 2, 178r and translation from Spencer, 1966, 1: 304.

Se volessi ancora per un'altra più facile via ritrarre ogni cosa, habbi uno specchio e tiello innanzi a quella cotale cosa, che tu vuoi fare. E guarda in esso, e vedrai i dintorni delle cose più facili, e così quelle cose, che ti saranno più appresso: e quelle più di lungha ti parranno diminuire.<sup>24</sup>

It was almost certainly with this same idea in mind that Brunelleschi's friend Leon Battista Alberti in *De Pictura* (1435) recommends, in the following extract, that the artist should use a mirror to adjust, verify or correct images taken directly 'from Nature':

Dehinc pari parsimonia additamentis proseguere quoad quid satis sit assequutum te sentias. Erit quidem ad eam rem cognoscendam iudex optimus speculum. Ad nescio quo pacto res pictae in speculo gratiam habeant, si vitio careant. Tum mirum est ut omnis menda picturae in speculo deformior appareat. A natura ergo suscepta speculi iudicio emendentur.<sup>25</sup>

There can be no doubt that artists in Italy employed mirrors in the 1430s as an aid to both constructing and also adjusting or verifying accurate two-dimensional constructions of space. (The implications of Alberti's advice are explored more fully later in the chapter). The Italian example clearly demonstrates that artists during the 1430s found mirrors to be a particularly useful aid. Although these texts cannot provide direct evidence for Netherlandish practice, they do establish contemporary understanding of mirrors as a tool for enhancing vision, particularly the effects of diminution in representation on a two-dimensional plane, which was otherwise

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<sup>24</sup> Filarete, *Trattato di arch*, 23, 178v.-179r. "If you should desire to portray something in an easier way, take a mirror and hold it in front of the thing you want to do. Look in it and you will see the outlines of the thing more easily. Whatever is closer or farther will appear foreshortened to you." Original text from Spencer, 1966, 2, 178v.-179r. and translation from Spencer, 1966, 1: 305.

<sup>25</sup> Alberti, *De Pictura*, 2.46, 88. "Go on making similar sparing additions until you feel you have arrived at what is required. A mirror will be an excellent guide to knowing this. I do not know how it is that paintings that are without fault look beautiful in a mirror; and it is remarkable how every defect in a picture appears more unsightly in a mirror. So the things that are taken from Nature should be emended with the advice of the mirror". Translation from Grayson, 1972: 89.

difficult to envisage. I will suggest in the following sections that van Eyck used mirrors for a similar purpose, although the fact that he would have used a curved rather than a flat mirror led to different visual results than Italian perspectival constructions.

### **2.3. Visual Analysis: A Comparative Study of the Spatial Character of the *Virgin and Child with the Chancellor Nicolas Rolin*.**

Van Eyck's paintings themselves provide the clearest evidence that he used a convex mirror. This section will analyse the spatial character of the *Rolin Virgin* as an example of van Eyck's approach to pictorial space, considering two distinct but related ideas: that he used a convex mirror as a practical tool to aid the process of drawing or visualising space; and that his paintings intentionally replicate certain spatial characteristics typical of convex mirrors.

My analysis responds, in part, to the suggestion made by David Carleton that van Eyck used a perspective 'system', which Carleton calls "elliptical perspective", designed to replicate the spatial properties of convex mirror reflections. Carleton supports his hypothesis through two analytical methods. In the first section, he compares two photographs taken from a scale model of the *Arnolfini Double Portrait* (Fig 2.7), the first taken directly using a standard 50mm lens (2.7 (1)), the second taken from the reflection in a 6" convex mirror (2.7 (2)). Carleton points out a number of convincing similarities between the convex mirror image and the painting: the large amount of floor space; the spatial relationship between objects; the effect of figures 'moving forward in space' (the 'tipping effect'); and, above all, the extremely wide angle of view.

The second part of Carleton's argument is, however, more problematic. He proposes that van Eyck employed in all of his paintings an "elliptical perspective"

'system' comprising two split vanishing areas arranged one above the other (Fig 2.8) in order to replicate the properties of convex mirrors. As John Ward has argued, however, there are several flaws in Carleton's methodology. Convex mirror images only have a single vanishing point (not two, 'split' points).<sup>26</sup> Ward further suggests that Carleton's perspective drawings are too simplified and do not take into account enough orthogonal lines to be sufficiently accurate.

At the centre of the debate between Carleton and Ward is the wider issue of whether van Eyck used any kind of 'system' in constructing pictorial space. As Netherlandish artists apparently did not use single-point perspective until the late 1450s<sup>27</sup> it is generally assumed that van Eyck must simply have used an empirical approach as opposed to a mathematical one. James Elkins, for example, has argued that van Eyck did not use any kind of mathematical system at all. Using a more accurate drawing of the *Lucca Madonna* than those used by Carleton (Fig 2.9), Elkins shows that orthogonal lines in this painting do not converge accurately to single points. He concludes that "we need not assume he had any system in mind".<sup>28</sup> Instead, he suggests, van Eyck's spaces were "constructed by eye...a compromise between medieval and Renaissance sensitivities".<sup>29</sup>

Despite the problems with Carleton's theory – in particular the idea that van Eyck employed a fully worked-out mathematical system – his initial suggestion that van Eyck's paintings closely replicate the effects of convex mirror images is, I

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<sup>26</sup> Ward, 1983 points out that there are curved edges in Carleton's image which are not a feature of van Eyck's panel. He then suggests that the effects noted by Carleton might also be reproduced without the mirror by changing the viewing angle, but his results are less convincing than Carleton's.

<sup>27</sup> Kern, 1904: 17, and 1905: 60-61, argued that Petrus Christus was the first to use a single point mathematical perspective construction in the North. He identified the earliest example, correctly, as the Frankfurt *Madonna with Saints Jerome and Francis*, 1457. For a more recent study of Petrus Christus's approach to perspective, see Collier, 1975.

<sup>28</sup> Elkins, 1991: 62.

<sup>29</sup> Elkins, 1991: 62.

believe, convincing. Furthermore, Elkins' suggestion that van Eyck simply derived his concept of space "by eye" does not account fully for the visual concepts and ideals that informed such an approach.

The following analysis argues that van Eyck used a combination of empirical and, to a limited extent, mathematical methods in constructing pictorial space. Whilst I agree with Elkins that van Eyck's paintings are not controlled by a pre-conceived mathematical system, the empirical experience on which they are based derives, I suggest, not from direct vision, but from curved reflections.

### **2.3.1. Perspective Analysis**

The remaining analysis comprises three sections. The first (2.3.1) uses perspective analyses of the *Rolin Virgin*, based on a 1:1 scale drawing of the panel, to assess its spatial characteristics and to evaluate the extent to which the painting follows or departs from a (mathematical) systematic approach. The second section (2.3.2) uses a scale model of the painting, photographed using lenses of varying focal lengths and a convex mirror, to demonstrate how the spatial characteristics identified in the first section are more likely to have derived from van Eyck's use of a convex mirror than from direct observation of three-dimensional space. The final part of the chapter (2.4) compares these findings with the spatial properties of the Washington *Annunciation*.

### ***General Characteristics***

The overall appearance of the space in the *Virgin and Child with the Chancellor Nicolas Rolin* (c.1435-36) (Fig 2.10) is ostensibly very convincing. To the naked eye, the orthogonals in the interior space all seem to converge, as one might

expect, at around the same point just above the bridge in the background. From this point, the meandering river gently leads the eye into the distant hills. Dramatic juxtapositions of scale between foreground and background, and effects of light and colour also contribute to a very convincing sense of three-dimensional space.

However, the painting is by no means mathematically 'accurate'. The perspective reconstruction Fig 2.11 allows the nature of the depicted space to be analysed and described in detail.<sup>30</sup> First, it does not appear that van Eyck employed a perspective system based on a single vanishing area or point.<sup>31</sup> Rather, there are, as a number of scholars have argued, multiple 'vanishing points' (or more accurately small 'vanishing areas') within a wider 'vanishing region' (or *Fluchteregion* as Doehlmann called them).<sup>32</sup> This region has a diameter of approximately 8.5cm, centrally placed between the two columns, just above the bridge in the background and is too large to have generated the system of orthogonals in the painting. The margin of error seems too great for an artist who, in all other respects, was extremely precise.

### *Perspective Analysis: Side Planes*

Fig 2.12 shows the 'primary' orthogonal lines on the side planes, which overlap by approximately 6cm in the painting.<sup>33</sup> There is no evidence that these two 'vanishing areas' dictated van Eyck's placement of the orthogonals in any systematic way. The multiple convergence points, as Fig 2.11 shows, appear far more random

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<sup>30</sup> The plate is given for illustrative purposes. The analysis was based on a 1:1 reproduction of the panel. Some short 'minor orthogonals' have been omitted here in the interest of clarity. This does not in any way affect the analysis.

<sup>31</sup> As suggested by Kern, 1904: 52-57.

<sup>32</sup> Doehlmann, 1905. Within the vanishing area there are 6 points where a minimum of 3 primary orthogonal lines intersect either precisely or within a margin of error of 1mm. The configuration of these points is not suggestive of a system where their placement was used to dictate the position of these lines.

<sup>33</sup> By 'primary', I mean those which appear to determine the structure of the planes. These must be of suitable unbroken length to be analysed accurately.

than systematic.<sup>34</sup> Put simply, this configuration makes more sense as the consequence of an empirical method as opposed to a mathematical origin: rather than starting with a vanishing point, or points, from which orthogonals could be generated (in the Italian manner), van Eyck began with a set of independently conceived orthogonal lines, which happened to converge at various points in roughly the same areas, as Elkins concluded. A likely possibility is that van Eyck conceived the two planes independently of each other without calculating any orthogonals mathematically (perhaps as drawings, if not directly onto the panel) before assembling them into a plausible 'composite' space.

There is still a question, however, as to why van Eyck's orthogonals converge in two general areas rather than one, or completely randomly. I believe this was a consequence or side effect of his conception of the side walls. As the side orthogonals converge to overlapping 'vanishing areas', much more of the side walls are visible than would have been possible using a single-point perspective construction. Fig 2.13 demonstrates how the angle of the side planes in van Eyck's panel differs from that of a single central vanishing point or area.<sup>35</sup> 2.13 (1) shows a simple single point construction while 2.13 (2) shows a panel of the same dimensions with a configuration of two points, like the general construction of the Rolin panel. The effect, shown in 2.13 (2), is that as the overlap between the points of convergence increases, the orthogonals move closer to their respective horizontals and the side planes consequently 'open out'. This same effect applies to the Rolin panel: its side

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<sup>34</sup> Also, there is no technical evidence of any incised, painted or drawn points, as one sometimes finds on paintings where a mathematical system was employed. See van Asperen de Boer and Faries, 1990: 37-49. For an example of a panel with a painted dot used as a vanishing point (Petrus Christus's *Virgin and Child Enthroned on a Porch*), see Ainsworth, 1994: 45.

<sup>35</sup> Fig 2.12 is based on the diagrams (9, 10 and 11) used by Carleton, 1982: 121 to illustrate the effect of his 'split vanishing points' theory. My diagram, although visually similar, is intended to demonstrate the different, but related effect of 'opening out' produced by overlapping convergence points on the side planes.

arcades are opened out further than either a single-point mathematical system or fixed-point natural vision would allow.

Carleton suggested that van Eyck devised a two-point vanishing system along the vertical axis (see Fig 2.8), but my analysis shows that the same effect results from 'opening out' the side planes. Taken together with the evidently empirical nature of the side wall orthogonal construction, the most logical inference is that van Eyck began with an 'empirical' or 'intuitive' desire to open out the side walls, which resulted in the effects Carleton identifies.<sup>36</sup>

The general 'opening out' of space, however, is emphasised by a number of more subtle spatial refinements. One of the most distinctive is the way in which the bay divisions of the arcades diminish at an unusually condensed rate in order to fit a series of three arches on each side. Based on the width of the bays that make up the rear wall (which measure 4.25 tiles),<sup>37</sup> Fig 2.14 shows that had van Eyck followed a method consistent with the scale and diminution of the floor plane, only 1.5 side bays would have been visible (assuming the dimensions of the panel remain the same). Had he either enlarged the panel itself, or reduced the overall scale of the image to accommodate three full side bay divisions (with this same diminution), the back wall and the figures would have appeared much further from the viewer. Using the measurements taken from the scale drawing with the projected bay divisions shown in Fig 2.14 superimposed, this relationship can be quantified more precisely. The span of Bay 1 in van Eyck's painting is diminished by 67% from the rate implied by the floor, Bay 2 is diminished by 61.5% and Bay 3 by 51%. As well as an overall condensing of the side planes on the horizontal axis, the rate of diminution – which

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<sup>36</sup> This corresponds broadly with opinion of Ward, 1983: 683 who suggests that the character of van Eyck's painting derives from "direct perception" from a close station point.

<sup>37</sup> The measurement between columns on the back wall at the scale of the painting is 10.2cm. The mean average measurement of tiles at this distance is 2.4cm, giving a measurement of 4.25 tiles for each bay division.



should remain constant – appears to increase with distance (or decrease as forms become closer). As I will explain in section 2.3.2, this rate of diminution is consistent with a curved plane as opposed to a flat one.

### *Perspective Analysis: The Back Wall*

The opening out of the side planes and the implication of a close viewpoint is emphasised further by the suggestion that the two rear orders twist outward slightly, so that more of the inside faces of the capitals and abacuses are visible. Although the orthogonals do not converge to the same areas as the side planes (see Fig 2.11), the abacuses of both orders overlap – in the same way as the orthogonals of the side plane – by approximately 6cm (see Fig 2.15). The orthogonals of the right order suggest that it twists just slightly less than the left order, consistent with the implied viewpoint just right of centre. Using a hypothetical vanishing point (generated using the centre of the ‘vanishing area’), the difference between the implied angle of the orders in single point perspective and in the panel was calculated to be 17° (for the left one) and 12° (for the right one). The black lines on Fig 2.15 show the position of the upper and lower orthogonals according to a single-point method.

### *Perspective Analysis: The Floor*

The most distinctive feature of the floor plane is that it appears to tip forward, implying a close viewpoint. This effect derives primarily from the implied relationship between the floor and the walls. Most importantly, the edges bordering the floor and side arcades are masked by the figures, leaving the viewer to determine exactly how and where the walls and floor meet. Fig 2.16 shows the position of these edges implied by the convergence of the other orthogonals in the side planes. (The

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vertical edges of the rear wall are continued until they meet the line of the floor to determine the far corners of the floor). If the viewer interprets the edges according to the orthogonals of the side planes, the floor orthogonals appear too steep.

Whereas the orthogonals of the other planes converge imprecisely, implying an empirical method, the floor orthogonals converge more precisely to two points (to within 6mm accuracy), suggesting the floor was constructed mathematically (see **Fig 2.17**). Eleven lines seem to have been generated from a point corresponding with the island in the background. However, two, or perhaps three (F8 intersects both points) of the central orthogonals, (F6, F7 and F8), converge to a second point 5.4 cm directly above this.

The placement of the three central floor orthogonals, I suggest, was an intentional refinement made to reinforce the tipping effect of the floor by raising the vanishing point slightly. As eleven of the orthogonals converge precisely, there is no reason to suppose that the central orthogonals were positioned differently by mistake. Also, in other respects, the floor tiles were measured carefully: along the bottom edge of the panel, the tile widths are consistent to within 2mm (a margin of error of 3.8%). It appears that van Eyck used the line F5, which is broken by Rolin's prie-dieu, to make this subtle refinement: he made the lower portion of the line converge to the same point as the other ten orthogonals, but above the prie-dieu, he changed the angle of the line, making the upper portion converge to a higher point (the dotted line on **Fig 2.17** shows where the line should be). This allows the unbroken row of tiles (lines F6 and F7) between Rolin and the Virgin to converge almost imperceptibly to this second, higher point.

### *Perspective Analysis: Summary*

There is no evidence that van Eyck used any kind of perspective 'system' to generate orthogonal lines. The apparently random position of convergence points (or 'vanishing points') suggests that, with the notable exception of the floor plane – which seems to have been constructed mathematically using two points – the space was constructed 'empirically' or 'intuitively'. As the orthogonals of individual planes converge more precisely than orthogonals of different planes, it is likely that they were conceived independently and later assembled into a 'composite space'.

The idea that van Eyck's pictorial spaces are composite assemblages is also consistent with what is known of his use of architectural motifs. As most scholars agree, the buildings and structures in van Eyck's paintings, such as Rolin's palatial loggia, are largely imaginary.<sup>38</sup> These imaginary spaces, however, must also have been based, to some extent, on parts of real buildings observed and drawn from life. Indeed scholars have found correspondences between existing buildings and architectural elements in van Eyck's paintings.<sup>39</sup> Furthermore, it seems to have been standard practice at this time to use workshop drawings – perhaps drawn from life – in a composite manner to assemble plausible architectural spaces.<sup>40</sup>

The features of van Eyck's painting – including a general opening out of space, the tipping effect of the floor, an exaggerated and inconsistent rate of diminution on the side arcades – are, as the following section will demonstrate,

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<sup>38</sup> This view is taken, for example, by Panofsky, 1953: 137 and Snyder, 1985: 109. Despite several unconvincing attempts to identify the building in the painting (such as de Ridder, 1979-80: 44-45 who associates the space with town-hall loggias of the time) no convincing prototypes for this kind of building survive.

<sup>39</sup> Lyman, 1981: 263-269, for example, has found persuasive correspondences between Tournai architecture and van Eyck's *Washington Annunciation*. Also Stiennon, 1977: 347-54 has identified correspondences between van Eyck's *Virgin in a Church* and a reconstruction of Liège cathedral.

<sup>40</sup> Jones 2000 argues that workshop drawings of background and architectural elements from the *Rolin Virgin* existed as early as c.1441-43 (shortly after van Eyck's death). These may originally have belonged to van Eyck himself. Significantly, they were used by his followers not to make direct copies, but to create plausible imaginary structures.

indicative of images with a very wide angle of view. Furthermore, a number of these effects also suggest a curved plane as opposed to a flat one. Section 2.3.2 will suggest that these effects derive from an empirical ‘composite’ method involving the use of a convex mirror.

### 2.3.2. Practical Demonstration

This section examines how van Eyck’s empirical approach was informed not primarily by direct vision, but by an engagement with the spatial properties of convex mirror reflections. It argues that the distinctive spatial characteristics of the *Rolin Virgin* identified in the previous section – including its exaggerated sense of spatial recession, the tipping effect of the floor and the slightly curved appearance of the ‘opened out’ side walls – replicate how this imaginary view would have appeared as a reflected image, or a combination of multiple images, observed in a convex mirror.

In order to demonstrate the influence of the mirror, I photographed a scale model of the painting<sup>41</sup> directly – using a ‘standard’ lens (50mm effective focal length), a ‘wide-angle’ lens (28mm effective focal length) and a ‘distant’ lens (80mm effective focal length) – and also reflected in a convex mirror (with an actual focal length of –28cm, but a comparative focal length, in this context, equivalent to about 14mm).<sup>42</sup>

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<sup>41</sup> Measurements for the model were taken from the scale drawing of the painting used in the previous section. (The side walls are assumed to be of the same dimensions as the back wall). The tiles (16 x 15.5) were used as a grid reference for the position of the figures. The figures were constructed in relation to the height of the nearest column on the corresponding grid. As their precise scale cannot be determined however, they are used here only as a visual guide. For the photographs taken in the mirror, the figures were removed as they obstructed the view of the camera.

<sup>42</sup> The focal lengths given for the lenses correspond specifically with the image size of 35mm film and therefore cannot be compared directly with the actual focal length of the mirror (–23cm). The equivalent effective focal length of the mirror is based on their respective ‘angles of view’: the 28mm lens has an angle of view around 66°; the 50mm lens has an angle of view of 40°, the 80mm lens has an angle of view of 24°; and the mirror’s angle of view is around 106°. As an approximate means of comparison, this is equivalent to a 35mm lens with an effective focal length of about 14mm.

On the basis of these photographs, I will first demonstrate how van Eyck's painting relates to the distortions and enhancements of the convex mirror image, and second, how he might have used mirrors in a more direct way, as part of a composite approach, to achieve these effects.

### *General Characteristics*

A general characteristic of van Eyck's work common to images produced by wide-angle lenses and convex mirrors is the tendency for objects to diminish more rapidly as they recede in space than they would in normal visual experience. **Fig 2.18** shows a comparison between the photograph taken with the wide-angle lens (**2.18 (1)**), the photograph taken with the normal lens (**2.18 (3)**) and the panel itself (**2.18 (2)**). (To ensure that each image is the same scale, the width of the nearest row of tiles and the height of Chancellor Rolin was used as a reference for scaling the photographs. The photographs were cropped according to those features visible in the painting). As **Fig 2.18** shows, the painting replicates two of the most distinctive features of space in the wide-angle view (**2.18(1)**) – the 'tipping effect' of the floor and the exaggerated sense of spatial depth. In comparison, the space in the 'normal' view (**Fig 2.18 (3)**) appears shallow, only a narrow portion of the floor is visible and the tiles appear more compressed vertically.

The area of the back wall relative to the image size provides a quantitative guide to the implied depth of the space in the three images. Expressed as a ratio  $x:1$ , the painting is very close to the wide-angle image, as the following values show:

- 2.18 (1).** Wide-angle photograph    ratio = 0.39:1
- 2.18 (2).** Rolin panel                      ratio = 0.40:1
- 2.18 (3).** Normal lens photograph    ratio = 0.61:1

Despite these striking similarities between van Eyck's painting and the wide-angle image, there are also differences between the two images. Most notably, in the side walls the wide-angle image shows much wider spans between successive columns and arches and, consequently, an overall wider format. (This conforms to the reconstruction I suggested for an accurate mathematical sense of horizontal diminution in Fig 2.14). In both Fig 2.14 and Fig 2.18 (1), the close station point produces wider visible sections of the side walls than is found in the painting. In Fig 2.18 (1), the width of the wall spaces represented measure 20mm and 22mm, but in the scaled down image of the panel the same widths measure 13mm and 13mm. In this respect alone the painting is closest to the 'normal' image (Fig 2.18 (3)).

As concave lenses were not invented until the 1460s,<sup>43</sup> van Eyck could not have observed these effects using a lens. What this comparison confirms is that, with the exception of the wider format, van Eyck's painting has the characteristics of a wide-angle image.

The most likely visual source for the wide-angle properties of van Eyck's painting is a convex mirror. As Fig 2.19 shows, the painting resembles the reflected convex mirror image most closely. Like the painting and also the wide-angle lens image, the back wall in Fig 2.19 recedes further into space (the back wall is just 1mm wider than in the painting, the rear columns are around 2mm longer and the visible height of the floor plane is just 2mm shorter). The area ratio between the back wall and the entire image is 0.36:1, which is also comparable with the painting. The wall also has a sense of curvature which makes the two rear orders twist outward slightly, and the inside faces of the storiated piers are visible. Although the visible portions of

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<sup>43</sup> Ilardi, 1976. See Introduction n. 108 above.

the side planes are wider than in the painting, the (almost square) format of the painting is closer to the convex mirror image than to the wide-angle lens image. On the side arcades, the mirror produces a similar 'opening out' of the bay divisions (most easily visible in the nearest arches) and the angles of the orthogonals are also close to those in the painting. Finally, the floor shows almost exactly the same tipping effect identified in the painting.

There is, however, an obvious difference between the painting and the convex mirror reflection: the painting's lack of visibly curved lines. Whereas straight lines appear curved in the mirror, straight lines in van Eyck's paintings always appear straight.<sup>44</sup> I am not, however, suggesting that van Eyck transcribed entire architectural spaces from convex mirrors. Nor am I suggesting that 'distortions' of space in his paintings are by-products of his method. Rather, I believe that he replicated a selective combination of effects observed from convex mirrors to instil in his images a dramatic wide-angle quality which conveys on a small scale the experience of a large space.

Although my primary argument is that convex mirrors informed van Eyck's concept of space in primarily theoretical terms, his engagement with them must have been based on a degree of practical experience, observing reflections of real architectural spaces. The following analysis considers in particular how the characteristics of individual planes in the *Rolin Virgin* relate to van Eyck's possible use of a convex mirror as part of his composite approach to constructing space (either in the preparation of working drawings or, at the painting stage, as a guide to the

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<sup>44</sup> There is a small amount of curvature evident in the floor of the *Arnolfini Double Portrait*. The crack between the floorboards extending from the dog in the foreground to the shoes behind the couple undoubtedly curves. This is noted by White, 1957: 234, Carleton, 1982: 121 and Ward, 1983: 681. Carleton suggests that a convex mirror may have been responsible for this curvature. His evidence does not support this, however. As Ward points out, orthogonals theoretically appear straight even in convex mirrors. My own inquiry has found, however, that orthogonals in fact frequently appear as curved when the viewer is positioned away from a centralised viewing position.

spatial recession of wide-angle images). It suggests that van Eyck used the mirror first to visualise wide-angle effects – including mild curvature – on individual planes and second, as a guide to assembling these composite parts into a plausible space.

### *Practical Demonstration: Side Planes*

I suggested in section 2.2 that the exaggerated and inconsistent rate of diminution in the side planes is a particularly unusual feature of the Rolin panel. In particular, the spacing of foreshortened architectural features on both side planes (most noticeably the arches and columns) departs dramatically from the mathematical rate of diminution used for the floor. Perhaps of greater significance is that the spacing of the system of columns and arches does not relate to how they would appear in reality, as the nearest arches appear too wide and the farthest pairs of columns appear much too close together. One consequently has the sensation that the side walls are not flat but slightly curved.

A first possible explanation for the unusual spacing of the side bays is that van Eyck used a convex mirror to reflect sequences of receding forms, such as a system of columns and arches. As the distortion of curvature is greater around the outer circumference of convex mirrors, it would have been more practical to position the reflected subject in the centre of the mirror, where straight vertical and horizontal lines appear less severely curved. To avoid his own reflection, it would also have been practical to stand to one side of the mirror. To demonstrate this possibility, the convex mirror was placed directly in front of the scale model's side arcade (see Fig 2.20) and the camera was first positioned centrally between the two rear columns (C1), and then to the right rear corner (C2). As a means of comparison, photographs were also taken with a flat mirror using a standard 50mm lens from the same positions and also

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directly from the front of the model (C3) using a wide-angle (28mm) lens. **Fig 2.21** shows a comparison between the painting and the photographs taken in the flat mirror; **Fig 2.22** shows a comparison between the painting and the photographs taken in the convex mirror; and **Fig 2.23** shows the direct wide-angle photograph taken from the front of the model.

The painting does not correspond very closely with either of the photographs in **Fig 2.21** taken in the 'undistorted' flat mirror using a standard 50mm lens. In **Fig 2.21 (2)** (taken at point C2), the visible area of the whole plane is wider, the angle of the whole plane is shallower and the span of the arches is only slightly reduced by spatial diminution. In **Fig 2.21 (3)** (taken at point C1), the visible width and the angle of the plane are similar to the panel, except the span of the arches and the gaps between the columns are much narrower and the effect of diminution is minimal.

In contrast, the side arcade of the painting corresponds very closely to the photographs taken in the convex mirror (**Fig 2.22**). On account of the diagonal viewing position, **Fig 2.22 (2)** (taken at point C2), displays wider gaps between columns and also more curvature on the extremities of the vertical axis, but the spacing of the columns is strikingly similar to the unusual spacing in the painting. The related convex mirror image taken from a central position (point C1), however (**Fig 2.22 (3)**), provides by far the closest parallel with van Eyck's panel: the visible width of the plane is the same as that found in the painting; the visible angle of the entablature above the arches is almost the same ( $43^\circ$  in the painting and  $44^\circ$  in **Fig 2.22 (3)**); and, unlike the images taken in the plane mirror, the spatial diminution of the columns and the visible gaps between them are visually very similar to the painting. Although this irregular spacing of columns can be detected visually, the table below, using measurements taken from the gaps between each of the columns in the scale images, demonstrates quantitatively just how closely columnar spacing in

the painting resembles the convex mirror image shown in Fig 2.22 (3):

### Columnar Spacing

	Column 1-2 (nearest) (mm)	Column 2-3 (furthest) (mm)	% increase of visible gaps
Van Eyck's panel	1.5	8.0	433
Plane mirror (Fig 2.21 (2))	6.0	9.0	50
Plane mirror (Fig 2.21 (3))	(0)	2.0	(-)
Convex mirror (Fig 2.22 (2))	6.0	11.0	83
Convex mirror (Fig 2.22 (3))	1.5	7.0	367
Wide-angle (Fig 2.23 (2))	7.0	12.0	71
Convex mirror – Side (Fig 2.25 (2))	3.8	9.0	137

As the table shows, the 433% increase in the visible gap between the columns in van Eyck's painting most closely matches the gaps in the convex mirror image (Fig 2.22(3)), which increase by 367%. As the wide-angle image (Fig 2.23 (2)) demonstrates, even at a close fixed viewpoint one would expect the visible gap between columns to be around 71% at its most dramatic. Only if the plane is understood to appear curved is it possible to achieve the sudden, enormous increase between the columns evident in the painting.

A second possibility is that van Eyck observed each plane separately in the corresponding side of a convex mirror, using three different viewpoints (as shown in Fig 2.24). At point A, the artist observes the right arcade, moving to point B to observe the rear arcade, and finally to point C to observe the left arcade.<sup>45</sup> Although, diagrammatically this may seem unusual, this is probably the most natural way to observe and understand the wide-angle properties of convex mirrors. It would also have been a very natural way for van Eyck to have studied how wide-angle spaces might be represented on a two-dimensional surface. Fig 2.25 (2) shows a photograph of the scale model taken in the convex mirror from a position corresponding with point C in the example shown in Fig 2.24. (The set-up was otherwise the same as the one used in the previous demonstration). The image produced from this viewpoint has the same dramatic rate of increase in the gaps visible between the columns – in this case 176% – and the plane has an obvious sense of curvature which corresponds closely with this feature of the painting.

My analysis therefore shows that a curved plane provides the best explanation for the spacing of the columns in the *Rolin Virgin*. Whether this curvature was observed in the centre of a mirror from an oblique viewing angle or observed in the side of the mirror corresponding with the nearest subject plane is difficult to determine.

#### *Practical Demonstration: Back Wall*

As I noted in the perspective analysis, the way in which the two central orders diverge from their expected position parallel with the picture plane, appearing to twist

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<sup>45</sup> At point B the artist would also see his own reflection. In practice, this is less obtrusive than one might expect. An artist copying from a reflection in a mirror could easily work around his own reflected image. I do not in any case believe van Eyck made use of a mirror in such a literal or direct way.

outward slightly allowing more of their inside faces to be visible (Fig 2.15), implies a wide-angle, close viewpoint. The photograph of the model taken with the wide-angle lens from a close viewpoint (20cm from the subject) (Fig 2.26 (2)), however, only vaguely replicates the appearance of the painting: the inside faces of the pedestals are visible, but they do not appear to twist outward, and the ellipses of the astragals are much shallower.

The spatial characteristics of the painting are, again, more consistent with how the back wall would appear observed in a convex mirror from a central viewpoint. Fig 2.27 (1) shows the back wall of the scale model reflected in the centre of a convex mirror. In this photograph, the two orders appear to twist outward, as they do in the painting, more of the inside faces of the pedestals and abacuses are visible, and the ellipses of the astragals are much deeper. By comparison, in Fig 2.27 (2) – which shows the same view taken with a standard 50mm lens at a point corresponding with the theoretical vanishing point used above – only a very slender portion of the inside faces of the pedestal and abacuses are visible, there is no sense of the twisting distortion evident in the painting and the ellipses of the astragals are very shallow. The only strong similarity with the painting is that straight edges appear straight.

The spatial distortions of the open arcade in van Eyck's painting are therefore consistent with the effects of wide-angle curvature visible in the centre of a convex mirror. The resemblance, however, is not comprehensive, but more selective. In the painting, straight edges – which appear curved in the mirror – are always shown as straight rather than visibly curved. In other words, effects observed in the mirror, such as the outward 'twisting' of the orders and the deepening of the astragal ellipses, are not simply copied from mirror reflections, but applied selectively to instil a comparable *sense* of curvature.

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### *Practical Demonstration: Floor Plane*

The floor in the *Rolin Virgin* is also consistent with the wide-angle, close viewpoint of a convex mirror reflection. **Fig 2.28 (1)** shows the reflected image taken in the lower half of a convex mirror from a central viewpoint, and **Fig 2.28 (2)** shows the model photographed directly, from the same relative position, with a 50mm lens. As these examples show, the floor plane in the painting closely resembles the convex mirror image: the visible height of the floor plane (indicated here by the black horizontal lines) is approximately the same in the painting as in the mirror image (33mm in both images shown here); the floor meets a rear plane of about the same width in both images (both around 57mm in the scale images); and the ‘tipping effect’ of the floor in the painting is very similar to the effect in the mirror. As in the other two planes, the only significant difference is the lack of visible curvature in the painting. In the mirror, the transverse (horizontal) lines of the tiles appear visibly curved whereas these lines in the painting are straight.

In contrast, the floor in the painting is quite unlike the photograph taken directly with a standard 50mm lens (**Fig 2.28 (2)**): the visible height of the plane is much more condensed in the photograph (around 20mm); tiles appear compressed vertically; the back wall is much wider (79mm) and apparently much nearer; and the plane appears generally flatter.

A consequence of the ‘tipping effect’ of the floor plane in the *Rolin Virgin* is that objects and figures – especially those in the foreground – also appear to slide or tip forward in space (**Fig 2.10**). Both the Chancellor and the Virgin appear to slide toward the bottom of the panel and one also feels that more of the Virgin’s dress is visible, as it trails on the floor, than the implied viewpoint dictates. It is as though we as viewers look straight at the two figures at eye level whilst looking increasingly downward as our eyes scan toward the bottom of their forms.

This effect is a particularly distinctive feature of objects reflected in the lower half of convex mirrors. Fig 2.29 shows a reflection of a glass tumbler placed on the floor of the model. As the photograph shows, the reflection of the tumbler appears to tip forward whereas the same glass seen from an identical viewing position without the aid of the mirror appears, as one would expect, to be sitting on a flat surface, allowing a significantly narrower portion of the glass rim to be visible. In much the same way, van Eyck uses the wide-angle properties of the floor plane as a means of presenting the figures of the Virgin and the Chancellor in this dramatic and distinctive manner. As with the side planes, the impression of slight curvature allows for an optimal view of the objects on this plane.

*Practical Demonstration: Summary*

The practical demonstration suggests that van Eyck's primarily 'empirical' approach to constructing pictorial space was informed or 'mediated' by his interest in the spatial properties of convex mirror reflections. First, there is a broad similarity between the character of van Eyck's imaginary space in the *Rolin Virgin* and the very wide angle of view typical of curved reflections. Common to the mirror image and the painting are several related effects deriving from this wide angle of view. These include an exaggerated sense of spatial recession, which makes the back wall appear further away, the opening out of the side walls and the tipping effect of the floor plane. It seems unlikely, however, that van Eyck intended to transcribe all the distortions or enhancements of the convex mirror. Most evidently, straight lines in the *Rolin Virgin* are shown as straight, not curved. The panel instead retains a more subtle sense of curvature which derives from a combination of selected effects typical of convex mirror reflections – including the twisting appearance of the orders on the rear arcade and an exaggerated sense of diminution in the side bays which implies a

slightly curved plane.

It is possible that the mirror provided van Eyck with a useful practical device for visualising spatial recession on a curved surface. It is perhaps significant that the written references from Alberti and Filarete specifically mention the mirror as a tool for visualising effects of perspective such as foreshortening. The diminution of the arcades in van Eyck's painting – which are consistent with a curved plane – might plausibly be a 'side-effect' of this practice. The selective way in which van Eyck's painting uses effects typical of a convex mirror image suggests, however, that his interest in using curved reflections was a primarily conceptual one, concerned with articulating an enhanced wide-angle view comparable with the experience of viewing a large space in a convex mirror.

#### **2.4. Spatial Analysis of the Washington *Annunciation***

In most of van Eyck's paintings, the same general spatial characteristics I have outlined in the *Rolin Virgin* are recognisable by eye.<sup>46</sup> Very few, however, have measurable architectural features that allow them to be subject to quantifiable spatial analysis. This section, however, looks at a second suitable example – the Washington *Annunciation* (Fig 3.100) – which, as I will demonstrate, conforms to the same wide-angle spatial concept as the *Rolin Virgin*.

##### *General Characteristics*

As the painting was almost certainly the left wing of a larger work,<sup>47</sup> it is important to bear in mind that its spatial character is equivalent to only the left side of

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<sup>46</sup> The *Dresden Triptych* has a different character and different spatial concerns. Notably, this is the only painting in which the Virgin and Child are positioned at the far end of the nave.

<sup>47</sup> See the catalogue entry in Hand and Wolff, 1986: 75-86.

the *Rolin Virgin*. One might presume, however, that the opposite wing would have mirrored the spatial character of the surviving panel.

Having identified the key characteristics of convex mirror images in the previous section, many of these are easily recognisable in the Washington panel even to the unaided eye. First, the panel has a very wide angle of view which, as described above, is distinguished by a general 'opening out' of the space. As in the *Rolin Virgin*, this effect derives primarily from the implication that the side wall curves slightly and the floor tips forward. The arches of the left arcade have the same distinctive, exaggerated rate of diminution identified in the *Rolin Virgin*. Also, as we appear to be looking down on the stool in the extreme foreground, there is a suggestion that it is sliding toward the right edge of the panel on a sloping floor.

As I have already analysed these effects in relation to the *Rolin Virgin*, it is not necessary to repeat the explanations for them in detail. However, I would like to demonstrate briefly how these effects – typical of convex mirror images – derive from mostly the same spatial methods and concerns I identified in the previous section.

### *Perspective Analysis*

Although orthogonals in the Washington panel do not converge to a single point or area, there is an internal coherence within individual planes. Fig 2.30 shows how orthogonals converge in three distinct areas. As in the *Rolin* panel, van Eyck has 'opened out' the space by allowing the side orthogonals to converge much further to the right (160mm at 1:1 scale) than those used for the floor and ceiling. No fewer than six of these converge to an area 2mm in diameter. The ceiling orthogonals are difficult to see clearly, but at least four converge to an area 5mm in diameter. At least five visible orthogonals on the floor plane converge, quite precisely, to a point corresponding with the *Virgin's* breast, suggesting that this point of convergence was



carefully worked out.

Although the ‘tipping effect’ of the floor derives from apparently the same concern with the wide-angle effects of convex mirror images, van Eyck used a slightly different method to achieve this in the Washington panel. Whereas in the *Rolin Virgin*, the ‘vanishing area’ is higher than the side arcades dictate (especially for the central orthogonals), in the Washington *Annunciation*, the ‘vanishing area’ is further to the left. As Fig 2.31 shows, by making the floor orthogonals converge here, they appear much steeper than if they had converged to the same area as the side wall.

This latter effect relies also on how van Eyck positioned Gabriel and the Virgin to obscure the edge bordering the floor plane and the side plane (just as the Virgin and Rolin obscure both of these edges in the *Rolin Virgin*). The precise spatial relationship between the floor and walls is consequently left open to a degree of interpretation. The edge obscured by Gabriel might be understood by the viewer to converge to the same point as the side orthogonals, as shown in Fig 2.31 (blue line), making the floor plane appear steeper. Alternatively, the edge might be understood to follow the floor orthogonals (red dotted line), making the side wall appear even more dramatically foreshortened. As this relationship is not clearly specified, something of both these effects is simultaneously implied.

Whilst there is no physical evidence of a drawn or incised vanishing point for the floor, van Eyck seems to have initially measured out the floor design mathematically. Lines are visible in the infrared reflectogram image (Fig 2.32), and in certain places through the over-painted surface of the painting (Fig 2.33), which suggest that he began by constructing a regular grid pattern. Fig 2.34 shows the probable original position of these lines before the changes were made to the floor design. (The red lines follow those visible in the painting, and the yellow lines follow those – visible in the underdrawing – which were later painted out).

On the basis of this floor grid, it is possible to generate a theoretical ‘distance point’ for this plane, which allows the spatial relationship between the floor and the side plane to be analysed in more detail. First, using the implied distance point, the grid was continued for the entire floor at the same rate of diminution. Fig 2.35 shows the lines generated by the distance point in blue and the projected lines of the theoretical grid in light grey. Second, the bays of the back wall were projected onto the drawing, allowing their widths to be calculated in relation to the grid tiles. Each bay measures five tiles of the grid. Using these measurements, the correct position of the side bays – each known to measure five tiles wide – were generated on the drawing. From this, a direct comparison can be made both visually and quantitatively between the geometric solution and van Eyck’s solution. The values are shown in the table below.

**Comparison Between Bay Widths in the Washington Annunciation and the Projected Geometric Widths**

Bay	Actual Width (mm)	Projected Width (mm)	Difference (mm)	Increase/Decrease (%)
4	62	37	25	68
3	37	26	11	42
2	20	22	2	-9
1	15	17	2	-12

The bays here behave in much the same way as those in the *Rolin Virgin*: as the arcade nears the viewer, the discrepancy between the geometric rate of increase/diminution increases. The table above shows that the accelerated rate of increase/diminution identified in the *Rolin Virgin* also applies to the side plane of the

Washington panel. Whereas the two distant bays are just slightly narrower in the painting than the widths generated geometrically, the third bay is 42% wider and the nearest bay is 68% wider.

**Fig 2.36** demonstrates diagrammatically how a curved plane would explain Jan's use of the unusual bay widths in the Washington *Annunciation*. (The same explanation applies also to the *Rolin Virgin*). The diagram shows a plan view of the space in the painting. The picture plane is represented by the line **AB**, where **A** represents the nearest edge of Bay 4 (the nearest bay). The vanishing point (**x**) used by van Eyck for this plane is known to be 405mm from point **A**. It is therefore possible to draw the axis **CD** on which the viewing point is found. The 'distance point', taken from the scale drawing and used in **Fig 2.36**, is 1840mm. The viewing point (the point from which the plane was seen by the artist) is therefore 920mm (half the value of the distance point). This point is represented by point **y** on the diagram. On the line **AB**, the points *ab*, *bc*, *cd* and *de* represent each of the bay divisions seen on the plane. The line **AE** represents the subject plane (the arcade). If 'viewing lines' are taken from the viewing point to meet each of the projected points *a* to *e*, the lines intersect with line **AE** to meet equal bay divisions on the subject plane. (The actual values of the divisions in the painting are not known). The division of the arcade into equal bays proves the values generated for the 'correct' bay widths on the picture plane. If, however, the values of the bay widths actually used by van Eyck are plotted onto this plan, they form bays of unequal width on the arcade **AE**. The bay widths used by van Eyck are shown here as follows: Bay 1 is represented by *ji'*; Bay 2 is shown as *i'h'*; Bay 3 is represented by *h'g'* and Bay 4 is shown as *g'f'*. As the diagram shows, the diminution of the bays suggests a curved plane as opposed to a flat one. The bays are represented on the diagram in green as the widths *ji<sup>2</sup>* (Bay 1), *i<sup>2</sup>h<sup>2</sup>* (Bay 2), *h<sup>2</sup>g<sup>2</sup>* (Bay 3), and *g<sup>2</sup>f<sup>2</sup>* (Bay 4). As the bay widths in the painting are increasingly exaggerated, it

is necessary that they are viewed from a more oblique angle. In summary, van Eyck has represented what would appear optically correct on a convex curved surface on a flat plane. The resultant effect is therefore a flattened image suggestive of a convex curve.

### *Practical Demonstration*

The unusual diminution of the side bays in the Washington *Annunciation* also conforms to how they would appear reflected in a convex mirror. Fig 2.37 shows a comparison between the side plane of the Washington panel and a photograph showing part of a scale model of this arcade taken in the corresponding side of a convex mirror. The model was constructed using the scale drawing of the panel. (The bays and arches visible on the rear plane of the panel were traced at scale size and used to form the two walls of the model onto which the bays and arches were drawn).<sup>48</sup> The photograph was then scaled to the size of the bays in the painting, using the width of the furthest bay as a constant. Fig 2.37 shows how closely the bays in van Eyck's painting follow the recession of the curved reflection.

### *Summary*

The Washington *Annunciation* demonstrates the same spatial concerns identified in the *Rolin Virgin*. In particular, the relationship between the side plane and the floor plane establishes a very wide angle of view (and a close viewpoint). There is also a strong sense of curvature on the left wall plane (although lines are not visibly curved) which is a typical feature of convex mirror reflections.

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<sup>48</sup> It is assumed that the bays and arches of the side plane are the same proportion and scale as those on the rear plane.

## 2.5. Conclusion

Both paintings discussed in this chapter selectively replicate the spatial effects typical of convex mirrors. These are not incorporated, however, as Carleton suggests, as part of a mathematical perspective 'system', but as a series of subtle, mutually enforcing implications or visual 'cues'. As scholars such as Elkins have argued, van Eyck's approach was primarily 'empirical'. I would argue, however, that his empirical approach was not simply a matter of translating directly observed architectural spaces into two-dimensional equivalents of visual experience. Rather, his paintings provide an enhanced view of reality, derived from convex mirror images and based on the concept of a slightly curved picture plane.

Using this spatial concept, van Eyck's paintings allow a wider angle of view than is possible in ordinary visual experience. In order to achieve this, they rely on visual implication and ambiguity, especially in determining the key relationship between the floor and side planes. Rather than clarifying such implications, numerous other spatial distortions serve to emphasise them. In both paintings analysed here, the floor is constructed in such a way that it appears to slant upward and objects in the extreme foreground – including the figures themselves – appear to slide or tip forward. As the obscured edge bordering the floor and walls implicitly disappears behind the panel frame in mid-foreground, the extreme foreground seems to advance further in space. On the side plane, the regular divisions of the arcade bays diminish at an exaggerated rate, emphasising an 'opening out' of the space and inducing a sense of curvature.

Although more conjectural, it is possible that van Eyck actually used convex mirrors in a more direct way to achieve these particular effects, either in the process of drawing independently conceived planes, or as a guide to working out the

diminution or foreshortening of forms such as columns or arches. In the case of the side arcades, the rate of diminution is remarkably close to the effects observed in the convex mirror in my analysis. In other respects, however, van Eyck appears to have found practical solutions to replicate the effects of the mirror in more subtle ways. (The refinement made to the central row of tiles in the *Rolin Virgin* is a good example of this). Most likely, however, van Eyck used mirrors not as a practical tool, but as part of the process of interpreting and translating a particular experience of space. Part of this process probably involved looking at, and perhaps drawing, reflections of real buildings observed in mirrors.

The sense of curvature implied by van Eyck's paintings, most importantly, departs from how space is perceived in normal visual experience. This, I suggest, derives from van Eyck's interest in the enhanced images of convex mirrors. Whilst panning across the visual field is the most natural way of viewing large spaces in direct vision, convex mirrors translate a similar experience from a fixed viewpoint. Their curved reflections provided, above all, an alternative view of reality, allowing much more of the visual world to be compressed, in all its complexity, onto the small surface of the glass. These reflections offered van Eyck both a different concept of space, and at the same time a practical means of achieving its painted equivalent which direct vision could not provide.

Having established detailed formal connections between the spatial properties of van Eyck's paintings and convex mirrors, the following chapters will demonstrate how this interest in using mirrors and lenses to interpret, translate and enhance visual experience informed not only his concept of space, but all visual aspects of his practice.

### **CHAPTER III**

#### **DEFINING THE CHARACTER OF VAN EYCK'S PRACTICE: OPTICAL NATURALISM AND THE PERCEPTION OF LUMINANCE**

### **3.1. Introduction**

The term ‘optical naturalism’ is commonly used in reference to the distinctive style of Eyckian paintings and their preoccupation with describing optical concepts and effects. Central to this broad characterisation is the idea that, on some level, van Eyck’s use of the oil medium – in particular his application of translucent glazes of paint – facilitated the development of a new Eyckian approach to painting. There is, however, a lack of clarity in modern scholarship about what exactly characterises ‘Eyckian’ or ‘optical’ naturalism and what, if any, was the role played by materials and ‘technique’ in facilitating this change.

This chapter aims to define more accurately how van Eyck’s paintings differed in their use of light – both stylistically and technically – from those by earlier and contemporary artists. It suggests that van Eyck’s paintings are distinguished not simply by descriptions of how light responds to various surfaces, but by their ability to replicate the real experience of perceiving light. The first part of the chapter looks at the existing tradition of oil painting, from which van Eyck’s paintings derive, and the role of translucent paint in pre-Eyckian panels. The second part of the chapter argues that van Eyck identified a new role for translucency in articulating or generating optical effects. It suggests that van Eyck developed an optical mode of description which, facilitated by the properties of the oil medium, prioritised the function of light in ways that works by other artists did not.

In addition to defining the optical character of van Eyck’s style and technique, the chapter also suggests that the development of this mode of representation was informed by his interest in the properties of images produced by reflection and in particular the reflected images of convex mirrors.



### **3.1.1. The Application of Technical Evidence**

Until recently, the idea that a technical explanation could account for the apparently sudden appearance of an 'Eyckian' style of painting was considered most likely. However, as technical evidence increasingly suggests that van Eyck's method and materials were in fact quite 'unremarkable' for their time, the likelihood that a purely technical innovation might somehow explain the development of 'Eyckian naturalism' now appears beyond even remote possibility. Despite this technical knowledge, many art historians continue to assert, somewhat vaguely, that van Eyck's translucent glazing technique allowed him to paint in a manner that previous artists had been unable to. The old idea that a technical explanation might account for van Eyck's new mode of naturalism therefore continues in a diluted form. What most accounts of van Eyck's style and technique do not address is why, if he used broadly the same methods and materials as earlier panel paintings, his paintings look so different.

There is, furthermore, significant disagreement over how important the use of oil media were in influencing the aesthetic goals of panel painters. For some, a causal link is evident between the development and understanding of oil as a binding agent for pigments and the new visual properties that this offers the innovative artist. For others, a perceived direct link between the use of oil as a medium and the changing appearance of panel paintings early in the fifteenth century is undermined (or at least viewed as problematic or simplistic) by the existence of earlier (mostly thirteenth- and fourteenth-century) panel paintings executed entirely, or partly, in oil. As further technical investigations are made on northern panel paintings, it is becoming more evident that painting in oil was in fact standard practice long before van Eyck's time. Indeed it has even been suggested that oil painting might actually have been "the indigenous painting technique in northern Europe, only temporarily displaced during

the fourteenth century by the Italianate egg tempera technique of the International Gothic Style”.<sup>1</sup> Whilst strong arguments have been made in support of the latter view, the tendency of recent scholarship has been to exaggerate the ‘similarity’ between early oil paintings and van Eyck’s paintings primarily on technical grounds. In response to the failure of early twentieth-century technical studies to discover the secret of van Eyck’s magical ‘nostrum’, recent scholarship on van Eyck’s technique has swung toward the antithetical view that there was nothing new or mysterious about van Eyck’s use of oil paint. This current opinion is, however, also quite misleading and therefore requires some initial clarification in the present context.

Three relatively recent technical papers by E. Melanie Gifford<sup>2</sup> (of the National Gallery, Washington DC), Ashok Roy<sup>3</sup> and Raymond White<sup>4</sup> (of the National Gallery London), relating to Eyckian and Pre-Eyckian paintings, outline the principal issues relating to the possible influences of the paint medium on the aesthetic goals of painters at this time. The first paper, a report on the materials and techniques used in the Baltimore panels from the *Antwerp-Baltimore Quadriptych* (c.1400) (Fig 3.1) provides evidence in support of the former (causal) argument, arguing that “great changes” took place in the working methods of painters around 1400 and that “the introduction of oil paint...changed the aesthetics of painting”.<sup>5</sup> Gifford makes reference to the thirteenth- and fourteenth-century Norwegian altar frontals (Figs 3.2, 3.9 and 3.10), pointing out that although these were executed using the same materials used by van Eyck, the handling is significantly more “schematic in handling and without fine detail”.<sup>6</sup> She goes on to argue that not only the materials but

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<sup>1</sup> Bomford, 1995: 14.

<sup>2</sup> Gifford, 1995a: 357-70.

<sup>3</sup> Roy, 2000: 97-100.

<sup>4</sup> White, 2000: 101-106.

<sup>5</sup> Gifford, 1995a: 357.

<sup>6</sup> Gifford, 1995a: 357.

also many aspects of technique employed by the painter of the Baltimore panels are broadly the same as those used by van Eyck. The panels are painted using a linseed oil medium, glazed layers are employed both to impart a jewel-like quality to the surface (for example in the ultramarine glazes on the drapery) (Fig 3.3) and also to illusionistic effect (in the transparent glazed layer of the stream water around Christ's feet in *The Baptism*) (Fig 3.4), and "wet-in-wet"<sup>7</sup> handling is employed in the modelling of forms in various parts of the panel (the lectern in the *Annunciation*, for example) (Fig 3.5). However, Gifford also notes that the general handling of the paint is 'archaic' and that mostly simple, pure pigments are used rather than using mixtures to produce varied tones (as one finds in van Eyck's work). Furthermore, she notes that the substantial proportion of lead white mixed into the colours undercuts the deep, rich saturation available with oil, indicating that the artist did not in fact fully appreciate the optical properties of his medium.<sup>8</sup>

In contrast to the view advocated by Gifford are recent papers by Ashok Roy<sup>9</sup> and Raymond White<sup>10</sup> in which they point out that van Eyck's layer structure is "straightforward" and relatively "standard for the period". As studies have clearly shown, van Eyck used a similar layer structure to earlier painters, consisting of a chalk and glue ground, an 'isolating layer' (usually lead white) and typically three (sometimes four) layers of colour – the first to establish light and shade, the second to soften tones and establish local colour and a final layer of translucent glaze.<sup>11</sup> White cites examples of thirteenth- and fourteenth-century wall paintings (from the Priory at

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<sup>7</sup> This term, as I use it here, describes the application of paint strokes blended into painted passages that are wet on the surface (though not necessarily freshly applied). It refers to a single paint layer but the technique can be employed over existing 'dry' layers beneath. It pertains primarily to opaque paint, as glazes will not usually blend into areas of wet paint.

<sup>8</sup> Gifford, 1995a: 364.

<sup>9</sup> Roy, 2000.

<sup>10</sup> White, 2000.

<sup>11</sup> Coremans, 1953: 69-76 and more recently Brinkman, 1993: 206-30.

Horsham St Faith, Norfolk, the Cathedral at Angers and St. Stephen's Chapel, Westminster Palace) (Fig 3.6 shows a fragment from the paintings formerly in St. Stephen's Chapel) and also panel paintings (thirteenth- and fourteenth-century Norwegian altar frontals) executed using broadly the same materials and layer structure as paintings by van Eyck. He argues against the often-repeated idea that these earlier artists did not fully understand the 'new' medium, demonstrating that their understanding of the optical properties of oil was sophisticated enough that they were able, like van Eyck, to make intelligent use of heat-bodied oil and diterpenoid resins to increase the saturation and transparency of particular glazed layers. He goes on to point out that these earlier painters, like van Eyck, also make use of wet-in-wet modelling and multiple translucent glazed layers.

The existence of a developed practice of oil painting in northern Europe as early as the thirteenth century certainly warns against making any simple, direct causal connection between oil as a paint medium and the new ways in which the optical properties of this medium were used by van Eyck and his predecessors in the first quarter of the fifteenth century. Furthermore, the impetus to use more deeply saturated colours and translucent paint layers to achieve atmospheric and illusionistic effects was not restricted to oil painting but is also evident in the practice of manuscript illumination, where early in the fifteenth century the use of gum arabic (and other gums such as plum) facilitated comparable characteristics to those attributed to the oil medium, such as transparency and increased colour saturation.<sup>12</sup> It is difficult to maintain that the use of the oil medium on panel paintings at the beginning of the fifteenth century provides a full or adequate explanation for the dramatically heightened realism and increased sensitivity at this time to the ways in which light activates the reflective and refractive properties of surfaces and materials.

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Although the use of the oil medium cannot in itself be considered the reason behind the dramatic change in style in the 1420s, this change surely could not have occurred without it. It is therefore worth recalling the key properties inherent to this medium.<sup>13</sup> First, oil paint dries very slowly, unlike egg tempera and glue-size. As a consequence, it is possible to blend wet-in-wet colours, and brush-marks can themselves be blended out. It is also possible to refine and rework passages of paint over a period of hours or days (depending on the type of oil, how it is processed, admixtures such as siccatives and working conditions). In contrast, the artist working in tempera is required to hatch or stipple the paint in single layers which cannot be blended directly. Evidence of the artist's hand is therefore always apparent in a network of visible marks. Second, brushmarks in oil can vary substantially in both width (according to the brush size) and also length, as the medium allows the painter to produce long, fluid, unbroken marks as well as smaller or shorter marks. In tempera, because the paint dries almost immediately on making contact with the panel, only short, broken marks can be achieved easily. Third, oil paints can be mixed with an increased proportion of oil (usually linseed, walnut or poppy oil) to produce a more transparent paint suitable for glazing. Using glazes, the artist is able to superimpose layers of paint, increasing the range of optical effects available. At one end of the tonal scale, glazes allow the artist to paint very pale, yet luminous, subtle hues over a pale reflective ground. Painted over an underlayer of the same hue, a glaze can increase the saturation of the colour. At the opposite end of the tonal scale, glazes allow the artist to paint shadows which maintain a richness in colour and a

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<sup>12</sup> Lawson, 2005: 158.

<sup>13</sup> This discussion is based heavily on my own practical experience and observations. See also Dunkerton, Foister, Gordon and Penny, 1991: 152-204, which provides a very good summary of the characteristics and handling properties of different media in their historical context, and also Gettens and Stout, 1966: 3-88. Meyer, 1991: 167-256, 254-326 deals quite comprehensively with technical and practical issues of handling paint in different media.

translucency in character. The refractive index of egg tempera and glue-size, in comparison, is too low to allow true glazes to be produced. The same colours that can be made into translucent glazes in oil are therefore opaque in tempera. In order to render tonal change, artists must instead rely on the admixture of varying proportions of lead white or black. As a consequence, lighter tones often have a 'milky' appearance and dark shadows tend to appear 'muddy'.<sup>14</sup> It was with the use of translucent glazes that artists were able to represent bluish hills affected by atmosphere in the far distance of landscapes and cast shadows projected by objects in bright light, with unprecedented realism—both pictorial developments new to the early fifteenth century.<sup>15</sup> Fourth, the oil medium allows the artist to regulate the lightness of pigments within a composition using either a greater proportion of medium or a subsequent superimposed layer. In tempera, the artist is unable to vary the relative lightness of unmixed colours (yellows, for example, are always lighter in tone than the 'darker' blues) and must therefore make allowance for this.<sup>16</sup>

In addition to the handling and optical properties of oil, one should also recognise that each of these properties affect the ways in which a painter is able to process and visualise a given subject mentally. Assuming an artist wishes to provide a faithful copy of an observed object, an awareness of how this might be transcribed in paint can influence how the object is seen and 'pictured'. A painter using an opaque method such as tempera must suggest shadow by modulating the local colour that forms the depicted object. The painter is therefore likely to consider the shadowed

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<sup>14</sup> Interestingly, Cennini recommends modelling entirely with white (not black), presumably to avoid making colours appear too muddy. See Cennini, *Il Libro dell'Arte*, 71 on modelling drapery. Alberti recommends using both white and black, but only sparingly. See Alberti, *De Pictura*, 2. 46.

<sup>15</sup> On cast shadows, see Da Costa Kauffmann, 1975 and on the Boucicaut Master's use of 'aerial perspective', see Guineau and Villela-Petit, 2002.

<sup>16</sup> Cennini, *Il Libro dell'Arte*, 78, 79 and 80 describes the use of colours with a low value, such as blue, to represent shadows. On the compositional and stylistic implications of the 'value scale', see Shearman, 1962.

side of an object as more of a physical material change of colour. In contrast, oil paint allows a painter to glaze a shadow over the top of existing painted forms. The painter is therefore likely to consider the shadow more as a kind of veil, superimposed selectively over the top of an unchanging colour. The implications of medium go beyond the physical ways in which paint allows or limits certain kinds of manipulation. Van Eyck's use of the oil medium not only allowed him to achieve certain effects in paint, it also had implications for how perceived effects of light (such as objects that appear to glow under bright illumination or the way in which shadows affect the colour of surfaces) are processed and valued by the perceptual system.

Whilst Roy and White argue that there is no evidence that van Eyck's materials or basic technique were anything beyond what might be described as standard practice for the period, it is unfortunate that neither author offers more than a cursory explanation of how van Eyck's work differs from the work of his predecessors. (It is perhaps also significant that their articles do not include plates showing the earlier oil paintings they cite in the text, most of which bear very little visual resemblance to a van Eyck panel, regardless of their 'technical' make-up). Gifford on the other hand presents a less distorted view of the aesthetic similarities and differences between Eyckian and pre-Eyckian works, explicitly stating that van Eyck and his contemporaries were the first generation to fully exploit and understand the potential of oil paint as a medium for rendering blended gradations of tone corresponding with closely observed light and shadow.

Both viewpoints, I would argue, are valid but also limited in what they reveal about van Eyck's practice. It is significant that White ends his discussion of van Eyck's technique with an acknowledgement of this limitation, suggesting that the secret of van Eyck's paintings is not technical, but a question of how he observed and

described nuances of light and shade. White's conclusion points to the fundamental problem in accounting for the similarities and differences of Eyckian and pre-Eyckian works. Style and technique are often less separable and distinguishable than studies tend to allow for. Just as discussions of van Eyck's style stop short of employing accurate technical evidence, technical studies also stop short of considering how stylistic intentions guide the principles and processes of technique. It is intended that this chapter will consider both 'stylistic' and 'technical' aspects of van Eyck's practice, primarily in terms of how they relate. The valuable evidence provided by technical researchers such as White, Roy and Gifford provides a basis for this analysis.

Before looking at van Eyck's paintings in detail, I should first like to look at some of the examples of earlier oil paintings referred to in the studies mentioned above. I will also outline the existence of a tradition of translucent oil painting c.1250-c.1410, looking not simply at how their technical structure broadly compares with van Eyck's paintings, but how translucent paint is used and what this suggests about the representational or aesthetic goals of these artists.

### **3.2. The Function of Translucency in Early and Pre-Eyckian Oil Paintings c.1250-c.1410**

As more panel paintings are subjected to technical examination, it is becoming slowly apparent that many of the few surviving northern panel paintings of the thirteenth and fourteenth centuries – including the *Thornham Parva Retable* (c.1330)<sup>17</sup> (Fig 3.7), and the *Westminster Retable* (c.1270-90)<sup>18</sup> (Fig 3.8) – derive their distinctive precious-looking appearance from a translucent oil painting

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<sup>17</sup> The *Thornham Parva Retable* was conserved 1994-2003 at the Hamilton Kerr Institute, Cambridge. A comprehensive technical analysis was published in Massing, 2003.

<sup>18</sup> No comprehensive technical analysis of the *Westminster Retable* has yet been published. Preliminary findings, including a confirmation of linseed oil as the primary binder, were published in Binski and Freestone, 1995: 59-72.



technique. In fact, it appears that the use of translucent oil glazes on panel paintings and wall paintings was a common practice outside Italy throughout the fourteenth century as similar glazing practices have been identified on panels from Cologne and Bohemia at this time also.<sup>19</sup> These early examples of the use of oil as a binding medium consistently demonstrate a desire to exploit its natural capacity for producing translucent, glazed effects resembling coloured glass or translucent enamel. Before looking in more detail at van Eyck's technique it is important first to look briefly at the tradition of translucent oil painting upon which van Eyck's technique was based. As the following discussion will show, the technique employed by pre-Eyckian panel painters was much the same as that adopted by van Eyck. The aesthetic intentions that dictated the use of translucent paint were, however, considerably different.

### 3.2.1. Early Oil Paintings c.1250-c.1380

As early as the twelfth century, the practice of using oil paint to produce 'pictura translucida' was recommended by Theophilus in his treatise *De Diversis Artibus*. In this treatise, Theophilus describes how a painting which is called 'translucent' (translucida) or 'lustrous' (aureola) can be made by applying colours, bound in linseed oil, to a polished layer of tinfoil:

Fit etiam pictura in ligno, quae dicitur translucida, et apud quosdam uocatur aureola, quam hoc modo compones. Tolle petulam stagni non linitam glutine nec coloratam croco, sed ita simplicem et diligenter politam, et inde cooperies locum, quem ita pingere uolueris. Deinde tere colores imponendos diligentissime oleo lini, ac ualde tenues trahe eos cum pincello, sicque permitte siccari.<sup>20</sup>

Although there are no surviving panel paintings from as early as Theophilus's text, many of the thirty-one surviving Norwegian altar frontals dating from as early as

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<sup>19</sup> These are discussed in Mora, Mora and Phillipot, 1984: 126-132 and Kühn, 1977: 179-90.

<sup>20</sup> Theophilus, *De Diversis Artibus*, 1.27, 25. "A painting, which is called translucent, is also made on wood and by some it is described as lustrous. You make it in this way. Take some tinfoil, not coated with varnish nor coloured with saffron but plain just as it is. Polish it carefully, and with it cover the area you want to paint by this method. Then very carefully grind the colours, which are to be applied with linseed oil. When they are extremely thin, apply them with a paintbrush, and so allow them to dry". Translation from Dodwell, 1961: 26.

1250 employ glazes of oil paint over a base layer of silver foil in the manner described by Theophilus. These panels are the best evidence we have for early oil painting techniques and are considered to be “peripheral survivors of a type produced in centres which were probably situated along the shores of the North Sea, in England, in Flanders and in France, where almost no works have survived”.<sup>21</sup> The altar frontal from *Heddal Church*, Telemark (c.1250) (Fig 3.9), for example, uses translucent oil paint bound in linseed oil over a ground of silver foil. The technique follows closely the process described by Theophilus for ‘translucent paintings’ (except all the Norwegian examples, with the exception of one, employ silver foil rather than tin foil).<sup>22</sup> Although some opaque paint is used on the panel, areas such as the garments are applied as a glaze which allows the silver foil to reflect transmitted light through the paint layer, producing gem-like colours. Also, on the *Kaupanger* frontal (c.1250) (Fig 3.10), the whole surface was covered first in silver leaf and then glazed with yellow (to produce ‘imitation gold’). Over this layer, cushions, linings and gems were rendered with a green glaze bound in oil and the flat red backgrounds were produced using a red glaze bound in oil.<sup>23</sup>

Whilst many of the Norwegian altar frontals exploit the reflective quality of metallic foil, other panel paintings like the *Thornham Parva Retable* make use of a reflective white underlayer in much the same way.<sup>24</sup> From the fourteenth century, it is apparent from surviving examples that this reflective isolating layer was a standard

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<sup>21</sup> Mora, Mora and Philippot, 1984: 128.

<sup>22</sup> Plahter, 2003: 162.

<sup>23</sup> Plahter, 2004: 224-231.

<sup>24</sup> Kempfski, 2003: 150. A lead white isolation layer has also been identified on the frontal from Odda (c.1325-50) and the frontal from Tresfjord (c.1325-50). See Plahter, 2003. Later paintings that use a lead white isolation layer include the *Dispenser Retable*, Norwich Cathedral (1380-1400), *Betrayal* and *Crucifixion* panels, Norwich Cathedral (1380-1400), East Anglian Panel Fragments, Fitzwilliam Museum, Cambridge (1400-1410), *Portrait of Richard II*, Westminster Abbey (c.1390-99), *Tester of Richard II and Anne of Bohemia* (1390). For these, see Kempfski, 2003: 150. The exterior wings of Melchior Broederlam’s *Crucifixion Altarpiece*, Dijon (c.1399) also use a lead white isolation layer. See Comblen-Sonkes, 1986.

aspect of the oil painting process. The primary function of the layer was to isolate the ground, preventing the oil medium being absorbed. However, many artists in northern Europe, including those working with oil-protein emulsions and tempera, also frequently exploited the optical effect of this layer. (Although the influence of the isolating layer is most effective with translucent paints, it also influences the colour and tonality of thinly applied opaque paint). It is apparent that artists were aware of how the underlayer influenced the final tonality of glazed paint. A Mosan *Seated Virgin* from a *Coronation of the Virgin* altarpiece c.1330-60 (Fig 3.11), for example, uses the same azurite glaze applied over black paint on the plinth to produce a dark blue and over white on the mantle to produce a pale blue.<sup>25</sup>

The most common application of glazed oil paint was in producing bright mid-tones and shadows when modelling drapery. Opaque paint containing an admixture of varying amounts of lead white was generally employed as an underlayer over which translucent glazes were applied to produce the mid-tones and shadows. For the robes of Saints Edmund, Peter and John the Evangelist on the *Thornham Parva Retable* (Figs 3.12, 3.13 and 3.14), for example, a layer of red lead was mixed with white to model the drapery over which a red lake glaze was applied. To produce darker tones, a thicker application of red lake was applied. Using this process, the white of the priming (a layer of lead white) is never entirely concealed, but is used to influence the process of modelling in the lighter tones. On St. Peter's robe and cloak (Fig 3.13), the artist used the influence of the underlayer to produce different red hues. Whilst the underlayer of red lead and white produces a cool hue for the robe, the same red lake glaze used for the cloak is placed directly over the priming, producing a warmer hue.<sup>26</sup>

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<sup>25</sup> See Boldrick, Park and Williamson, 2002.

<sup>26</sup> Sauerberg, Howard and Tavares da Silva, 2004: 192-93.

The move toward a more transparent aesthetic is also evident in architectural painted decoration and wall painting.<sup>27</sup> As a number of studies have shown, wall paintings throughout northern Europe from c.1300 display an increasingly large proportion of organic binding media – primarily linseed oil as well as animal glue and resins – usually applied in glazed layers.<sup>28</sup> Significantly, we know from surviving documents that painters decorating the castle of Hesdin from 1320 used a technique involving oil, glue and eggs applied over a ground of lead white.<sup>29</sup> In order to obtain effects of luminosity and translucency, the lime-based grounds were being replaced by lead white grounds which were made to interact optically with the translucent paint layers.<sup>30</sup> There was, as studies have suggested, a clear change in the artistic intent of wall painters c.1300 toward an aesthetic “which brought it closer to the realm of enamel and goldsmith work, wherein a high value was placed on the precious quality of materials transformed by light.”<sup>31</sup> Analyses of surviving thirteenth- and fourteenth-century wall paintings such as the *Saint Maurille* cycle in the choir of Angers Cathedral (c.1270-80)<sup>32</sup> and those from the fragments of St. Stephen’s Chapel Westminster (c.1352-63),<sup>33</sup> which predominantly use an oil medium, have identified a method similar to that employed by panel painters. As with panel paintings, glazes are either applied directly over a reflective ground (usually lead white but occasionally a

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<sup>27</sup> The use of glazed paint in imitation of enamel and goldsmiths’ work in the upper chapel at the Sainte Chapelle, Paris (1243-48) is often cited as an early example of this trend. See Mora, Mora and Phillipot, 1984: 126-27, and Phillipot, 1983: 98, for example.

<sup>28</sup> For the development of oil glazing techniques in northern European wall paintings, see Phillipot, 1983: 96-101. On the use of these techniques in England, see, most recently, Howard, 2003.

<sup>29</sup> One act of 1320 states that the painting ground (*champs des ymages*) is to be covered with the finest lead that can be found (*du plomb le plus fin que l’on pourra trouver*). Another document mentions that oil was used to make tempera for colours (*pour faire des détrempe à couleurs*). For these, see Dumay, 1874, 237-46, cited in Mora, Mora and Phillipot, 1984: 124-25, and Phillipot, 1983: 99.

<sup>30</sup> Howard, 2003.

<sup>31</sup> Mora, Mora and Phillipot, 1984: 126.

<sup>32</sup> Demailly, Hugon, Stefanaggi and Nowik, 1998.

<sup>33</sup> Van Geersdaele and Goldsworthy, 1978.

sheet of silver) or more commonly over an opaque layer which establishes modelling using both the ground and an admixture of white. For the red robe in the King's banquet scene in the *Saint Maurille* cycle, Angers cathedral (Fig 3.15), a red robe was produced by combining red lake and lead white to establish modelling over which deeper tones were glazed with a layer of red lake.<sup>34</sup>

In addition to having a technical function in the modelling of drapery, one of the key applications of oil paint during the thirteenth and fourteenth centuries was in imitating or contrasting with other lustrous or translucent materials. On three Norwegian tabernacles, mostly red and green glazes have been identified on top of silver and gold leaf, suggesting the quality of a precious material. Unn Plahter has recently pointed out that there is perhaps some significance in where this technique has been applied, as this practice was restricted to the inside of the tabernacles, including the figures of the Virgin and Child, as well as the background and inner side of the tabernacle doors. In contrast, only opaque paint was used on the outside of the structures.<sup>35</sup>

Panel painters were likewise sensitive to how paint might be used to imitate other materials. The *Westminster Retable*, for example, was painted on its reverse side in imitation porphyry, presumably mimicking the mosaic porphyry pavements of the sanctuary in Westminster Abbey where the retable was originally installed. Likewise on the front of the retable, paint was used in imitation of both glass and enamel. The 'enamels' used in the decorative borders for example were actually painted on the gold ground and covered with glass. Perhaps most remarkable, however, is the way in which glazed oil paint is combined visually with an array of translucent materials

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<sup>34</sup> Demailly, Hugon, Stefanaggi and Nowik, 1998: 12 and plate 5.

<sup>35</sup> Green and red glazes over silver or gold leaf have been found on the back wall of the *Hedalen Tabernacle* (c.1250), the inner side of the door remaining from the *Fet Tabernacle* (c.1250-70) and also on the sculpted drapery of the Virgin and Child in the *Dal Tabernacle* (c.1250-70). Plahter, 2004: 195-99.

such as coloured and clear glass and fictive glass 'gemstones'.<sup>36</sup> The dominant repetition of the intense red, green and blue glass outside the eight-pointed medallions is repeated, in imitation of the same effect, in the translucent oil glazes of these same colours on the drapery of the figures in the painted areas inside the medallions (Fig 3.16). Indeed all the painted sections, such as the panel showing Saint Peter (Fig 3.17), use glazed oil extensively, producing luminous reds, blues and greens – broken with passages of delicate gilding – which imitate and respond to the coloured glass set into the lights of the structure and also to materials, such as the window glass, in the abbey itself. Underneath the coloured glass is a silvered ground which – by allowing light to reflect back through the glass – makes the colours appear translucent (rather than dark as they would appear without the silvering).<sup>37</sup> Although they no longer survive, the *Thornham Parva Retable* is also thought to have contained painted and gilded glass elements in the arch spandrels and the canopy<sup>38</sup> which would have responded to the parts of the canopy painted with translucent glazes of red and green over silver and gold leaf.

During the thirteenth and fourteenth centuries, translucent oil paint had two primary functions in panel painting. First, it was a means of producing varied tones and hues, especially in the rendering of drapery, by tinting the underlayer to produce a different colour or a darker tone. Second, translucent paint, when applied over a metallic or reflective white layer, was used to suggest a quality of preciousness, either imitating or responding to other translucent materials. In most cases, translucent oil paint retains both of these functions together, providing a means of articulating form

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<sup>36</sup> Since the preliminary report by Binski & Freestone, 1995 little has been published on the technique and materials of the *Westminster Retable*. Binski, 2005 includes very useful images. What follows is, however, based primarily on personal observation *in situ*.

<sup>37</sup> Binski and Freestone, 1995.

<sup>38</sup> Bucklow, 2003: 38.

or producing a different hue but never failing to suggest that the paint itself has a jewel-like preciousness.

### 3.2.2. Pre-Eyckian Painting c.1380 - c.1410

The idea that translucent oil should replicate the appearance of materials such as enamel or glass likewise dictated the practice of northern panel painters c.1400. As scholars have argued, large carved and painted retables sought validation particularly by imitating the appearance of metalwork reliquaries.<sup>39</sup> Likewise, small devotional panels such as those associated with the Burgundian court sought to “imitate the appearance of goldsmiths’ tableaux”.<sup>40</sup> Just as the gilded wood replicated the appearance of real gold on panel paintings of c.1400, the approach to painting was also heavily influenced by the materials commonly used to colour metalwork, such as gemstones and enamel.<sup>41</sup> In particular, methods of producing bright, translucent enamel images using the *basse-taille* and *rouge-clair* techniques, which were apparently favoured by the Burgundian dukes, share many of the same aesthetic and technical concerns as oil panel paintings.

Of the few surviving panel paintings from the period c.1380-c.1410, many are strikingly similar in appearance to the enamelled goldsmiths’ work produced in Paris during the fourteenth century and in Flanders from c.1415. Indeed some panels have even been described as “painted substitutes” for more precious metalwork objects.<sup>42</sup> The Southern Netherlandish or Mosan *Tower Retable* (c.1390-95) (Fig 3.18), for

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<sup>39</sup> This connection has been explored by Jacobs, 1998.

<sup>40</sup> Lorentz, 2004: 95.

<sup>41</sup> Bichler, 1992: 23-35 looks at how the polychromy of carved retables by Jacques de Baerze relates to colouring techniques used in metalwork. See also Chapuis, 2004 who argues convincingly that the porcelain-like figures painted by Stefan Lochner in the 1430s and 1440s were painted imitations of ‘ronde-bosse’ enamelling.

<sup>42</sup> Belting, 1994: 422.

example, appears to imitate the material quality of gold reliquary shrines or 'tabernacles' such as the one attributed to Jean de Touyl c.1340-50 (Fig 3.19) and the *Choques Triptych* of c.1390-1400 (Fig 3.20).<sup>43</sup> The form of the painted retable closely follows the smaller metalwork examples, with a central *caisse* (which probably contained a sculpted figure), enclosed by folding wings.<sup>44</sup> In its use of materials also, the retable aspires to an aesthetic of preciousness. The carved oak panels, most obviously, are covered in gold leaf, in imitation of goldsmiths' work, and the painted wings – dominated by gold grounds and a bright, saturated blue – likewise correspond visually with the brightly coloured enamel scenes of the metalwork examples.

Stylistically, paint itself was often made to imitate, or compete with, specular surfaces such as gilded sculpture and the metallic foil underlayers of translucent enamels. In particular, highlights on pre-Eyckian panel paintings are more typical of specular (lustre) highlights than modelling highlights (see further discussion in section 3.3.1). On the *Tower Retable* for example, the painter consistently uses quite thickly applied bright highlights which do not graduate smoothly into the mid-tones, suggesting modelling, but instead progress very rapidly to an almost white tone. This sudden tonal transition from dark to light is a typical feature of metallic surfaces. The strong highlights used on the drapery of Mary and Joseph in the *Nativity* (Fig 3.21) suggests a shiny material, but on closer inspection one finds similar strong white highlights on the hairs of Joseph's beard as well as on areas defining the facial features of figures. The implication is that a source of illumination from our space

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<sup>43</sup> Other examples of these 'tabernacles' include a fourteenth century example in the Pierpont Morgan Library, New York, one dated c.1320-30 in the Poldi-Pezzoli Museum, Milan and another in Seville Cathedral Treasury, dated 1316-22. The latter example, especially, is strikingly similar in form to the Antwerp *Tower Retable*. For reproductions of these, see Geens, 2002: 88-90 and figs. 2.4, 2.5 and 2.6, who is primarily concerned with smaller-scale goldsmiths' work.

<sup>44</sup> It is not known whether the *Tower Retable* originally formed part of a larger work or not. Stroo, 2002, in the only critical study of the object, suggests it may be fragment of a larger altarpiece, perhaps similar to the one shown in the Weyden Group *Exhumation of St. Hubert* (c.1440, National Gallery, London).



provides the modelling of the forms, and also a fairly uniform sense that these forms are literally covered with a lustrous material. The closest visual parallel with the nature of these highlights is found on gilded wood figures such as those on the interior of the *Crucifixion Altarpiece* (1390-99) by Jacques de Baerze and Melchior Broederlam (Fig 3.22) on which the drapery folds are defined by the same strong specular highlights. As it is probable that the *Tower Retable* originally formed the upper part of a gilded altarpiece such as the one by Jacques de Baerze, it makes sense that the painted forms should have to compete with, if not imitate, the lustre of the gold in a literal manner. On the many wooden gilded figures which were glazed with translucent coloured paint in the fourteenth and fifteenth centuries, the similarity would have been particularly strong.<sup>45</sup>

The resemblance between painted panels and the more lustrous materials of goldsmiths' work was not purely formal and stylistic, however. There is also a broad relationship between the techniques used to produce translucent *basse-taille* enamels and the way in which panel painters used paint, especially in translucent oil glazes. To produce 'gem-like' colours, painters would glaze pigments bound in oil over lighter (often white) underlayers, producing bright, saturated hues. In lighter areas some white is admixed, but otherwise the paint is glazed unmixed allowing the underlayer to be seen through the paint layer. In darker areas of shadow such as folds, a thicker layer of the same colour is applied. Likewise, the technique of translucent enamelling uses much the same sequence.<sup>46</sup> First, outlines of forms are delineated with a tracer into the metal layer. Details are then chased into the metal at varying depths

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<sup>45</sup> The practice of using translucent paint over gilt sculpture appears to have been a widespread practice in northern Europe from the fourteenth century. An Upper Rhenish walnut sculpture of the *Death of the Virgin* (c.1430-40), for example, shows evidence that some of the apostles' gowns were originally glazed with green, red or blue paint over silver leaf. See Jopek, 2002. Good later examples are the figures on the *Herlin Altarpiece* (1466). See Broekman-Bokstijn, van Asperen de Boer, van 'T Hul-Ehrnreich and Verduyn-Groen, 1970: 370-400.

<sup>46</sup> Maryon, 1951-52.

corresponding with areas of light and dark. When the coloured translucent enamel is poured into the metal, the deeper recesses produce the darker tones and the more shallow parts reflect the metallic base. Although the method of translucent enamelling is more sculptural in nature than painterly, the optical constituents operate in the same way as a glazed oil painting. In both media, the layer structure is the same: a reflective underlayer over which a translucent colour is applied. The method of modelling is also, in optical terms, the same: to produce light tones, the coloured medium is made thinner and to produce darker tones, the medium is made thicker.

Although the panel paintings of c.1400 demonstrate the same well-established concern with using oil paint to suggest a material 'jewel-like' quality, there is also at this time a growing interest in how translucent paint might be employed to illusionistic ends. The artist of the *Antwerp-Baltimore Quadriptych* (c.1400) made extensive use of layers of translucent paint glazed over a reflective layer underneath. In places, the artist makes use of a lead white isolating layer over which is a modelling layer containing lead white and a further layer of glazed pigment or lake bound in linseed oil. In other areas, the artist uses a gilded base over which a transparent glaze is allowed to play on the hue and metallic reflection of gold.<sup>47</sup> In the *Nativity* panel, for example, the artist has painted the Virgin's drapery (Fig 3.23) over an intermediate white layer, modelling the forms in ultramarine and lead white and glazing over this with a layer of pure ultramarine.<sup>48</sup> The artist creates shadow simply by using a thicker layer of the same hue. The brocades worn by the figures in the foreground, however, have been painted quite thickly over a gilded base punched with floral motifs. In the *Saint Christopher* (Fig 3.24) panel and also in the *Baptism* panel, the artist again makes use of the gold base, painting a translucent glaze of green over

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<sup>47</sup> Gifford, 1995a: 360.

<sup>48</sup> Gifford, 1995a: 362.

this to suggest the waves of the water.<sup>49</sup> In both of these panels, the logic behind the use of a reflective layer is dictated by the known properties of the material being depicted - armour and expensive brocades are rendered in a material (in this case gold leaf) that most closely resembles shiny or metallic materials. The use of the gilded base in the water is more illusionistic, but still dictated primarily by the idea that water glistens and is transparent.

There was therefore a discernible move after 1400 in panel painting toward finding illusionistic applications for translucent paint. In each case, however, a direct equivalence is posited between the translucency of the paint and the perceived translucency or lustre of the depicted material. Moreover, the idea that paint should itself maintain a lustrous, gem-like material quality was still an important concern for panel painters and their patrons c.1400, just as it had been c.1300. Likewise, the basic idea that oil paint could be used in translucent layers over a reflective or partially reflective underlayer remained unchanged from the time of Theophilus to van Eyck's time. Technically speaking, it is as part of this tradition that van Eyck's paintings should be seen. As scholars have argued, his paintings employ the same materials and the same layer structure as most earlier oil painters. Undoubtedly, the jewel-like character of van Eyck's paintings is very much part of the medieval oil painting tradition.

The broad similarity between the established tradition of translucent oil painting and van Eyck's technique should, however, not be overemphasised on the strictly technical grounds of methods and materials. As the following discussion will demonstrate, it is in the substantial differences between the concerns and intentions of van Eyck's paintings and the intentions of earlier oil paintings that one finds an

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<sup>49</sup> Gifford, 1995a: 360 and Gifford, Halpine, Lomax and Schilling, 2003: 110.

optical character, unique to van Eyck's practice, that dictates issues both of style and of technique.

### **3.3. Optical Naturalism and the Function of Translucency in Eyckian Painting**

The aesthetic of translucency that developed in oil painting, as well as in other media, from just before c.1300 provided van Eyck with the methods and materials that formed the basis of his translucent technique from the 1420s. Despite employing the same methods and materials as many earlier panel painters, however, van Eyck's paintings are very different from earlier paintings in their attention to the transcription of visual experience. Whereas earlier painters had employed translucent paint either with a limited interest in its capacity for illusionism or with a concern for imparting a lustrous, precious quality to the panel itself, van Eyck found in the translucent property of oil paint a means to describe the various ways in which objects respond to light. By employing combinations of translucent, glazed paint alongside opaque passages of paint, van Eyck was able to describe how the changes in luminance perceived in reality convey information about space, form and texture. As well as describing perceived effects of light, van Eyck also manipulated his materials in order to generate luminary effects. The relationship between these two aspects of his practice constitute an 'optical naturalism' that was devised by van Eyck in contrast to an opaque style of painting employed by artists of the Campin/Flémalle/van der Weyden schools.

In seeking to represent and replicate the ways in which light informs our perception of reality, van Eyck's 'optical naturalism' suggests a kind of image that is more directly derived from the image-making potential of light than from the intervention of the artist's hand. In this respect, his paintings derive their notion of realism from their association with images created not by paint but by light alone. I

should like to suggest that in referring to the properties of such images, van Eyck's paintings seek a specific correspondence with not only the images of vision itself but also with images generated by reflection, in particular mirror images. In addition to analysing some of these correspondences, this section also suggests that both the perception of light effects in real visual experience and the solutions van Eyck constructed to replicate them are likely to have been informed by his use of a (convex) mirror.

### 3.3.1. Describing Luminance

During the 1420s, the description of light became the primary means through which a new mode of representation was conceived. Paintings produced at this time by artists working in the workshop or style of Robert Campin and early works attributed to van Eyck<sup>50</sup> all prioritise the role of light in the process of creating and reading images. The following analysis will demonstrate how the dramatic shift toward a more naturalistic style of painting can be explained as a consequence of several innovations introduced by artists in response to this new concern. Although Campin and van Eyck shared an increased sensitivity to the capacity of light, the approaches they employed in translating their concerns into painted images differed. Certainly, Campin used descriptions of light in far more complex ways than artists had c.1400. Only in van Eyck's, work, however, does a sensitivity to the behaviour of light become the single most important aspect of transcribing and reading visual experience. The following sections look at how van Eyck's work differed from the

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<sup>50</sup> I am treating the *Ghent Altarpiece* as a work by Jan and Hubert. The consistency of the style and technique with autograph works by Jan suggests, however, that the painting in its present form is principally Jan's and that he was probably involved in the painting at an early stage. See n.53 and also Chapter 4, n.8 and n.9.

work of his predecessors and contemporaries in its description of shadows, lustre and highlights, illumination, luminance and colour.

### *Shadows and Three-Dimensional Imaging*

Psychologists now understand some of the ways in which shadows contribute fundamental information to our perceptual system about the shape and texture of objects, as well as the space they inhabit and the nature of the source of illumination acting upon them. A cast shadow, for example, not only suggests the direction of the light source but also indicates its intensity. The location of the shadow indicates whether the object is resting on a surface. It also indicates something about the nature of the surface it is projected onto – shadows on a polished surface like a tile will tend to have sharp edges whilst shadows on a soft surface like a carpet will tend to have bumpy, softer edges. People do not, however have a uniform attitude to shadows – some people look through them, some look into them, some occasionally do not perceive them at all.<sup>51</sup> Prior to the fifteenth century, artists were only concerned with ‘self-shadow’ (or ‘attached shadow’) as far as these kinds of shadows indicated ‘shape through shading’. Presumably artists were able to perceive cast shadows but did not consider them useful or relevant to their mode of representation. Only in the fifteenth century did artists begin to adopt a visual language that employed a full range of shadow types as a means of suggesting the nature of space, texture and illumination as well as the shape of objects. Around 1420, Robert Campin began to encode shadows with a range of specific visual information that, in part, accounts for the enhanced effect of realism scholars have perceived in panel painting at this time. From the late 1420s and into the 1430s van Eyck developed the language of shadows employed by Campin into a more comprehensive concern with light.

As there is no standard terminology for the description of specific shadow types, it is necessary to define several terms that will be employed to describe real or depicted shadows throughout this chapter. The terms I have chosen to employ are not intended to refer to any terms employed in written sources from the fifteenth century, but are rather used for the present purpose in the interests of descriptive accuracy. To describe shadows produced by the obstruction of light by a body I use the term 'cast shadow'. This term applies (most commonly) to shadows cast on a different surface and also (more rarely) to those cast on the same surface as the one that causes the obstruction. 'Self-shadow' (often called 'attached shadow') refers to shadows that are produced because the body faces away from the light. To describe shadows often called 'modelling' or 'shading' shadows I use the term 'slant/tilt shadows', whereby slant indicates shadow generated by a surface partially facing away from the light on the vertical axis and tilt indicates the same situation on the horizontal axis. Where I refer exclusively to the pictorial depiction of slant/tilt shadows I use the term 'shape from shading'.<sup>52</sup>

On early oil panel paintings, the suggested light source is not consistent. Instead, figures and objects are lit by an even, diffuse light from the front, employed as a means of suggesting and describing form. At the turn of the fifteenth century, the concern for light and shadow is much the same as one finds a hundred years earlier. On the *Antwerp-Baltimore* panels, for example, there is only a minimal concern with the internal direction of the light. Shadows and highlights are included to indicate modelling and the slant and tilt of objects ('shape from shading'). In this sense, the lighting is consistent in coming from in front of the panel, falling most intensely on

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<sup>51</sup> See Rood, 1941: 61 and Da Costa Kaufmann, 1975: 259, n.5.

<sup>52</sup> The terminology of shadow types is influenced by, but not identical to, that suggested by Baxandall, 1995.

the face of objects nearest the viewer. There are, however, no cast shadows and no sense of any change in the radiance of the depicted light throughout the scenes. The interaction between the light source and the panel is dominated by the relationship between the light from the viewer's space and the surface of the panel. Much like earlier panels, the surface is made to reflect, refract, absorb and transmit light according to the variety and combination of painted, glazed, tooled and burnished passages. Such manipulation of materials is not, however, integrated into any concern with a depicted light source. Although highlights and shadows on the painted figures and objects are consistent with an extrinsic, perpendicular (90°) light source, all depicted forms are illuminated equally, as though each form shares the same spatial position on the surface of the picture plane, unaffected by the obstruction of other objects and by the way light is modified by its interaction with each obstacle in its path.

Around 1410, manuscript illuminators such as the Limbourgs and the Boucicaut Master began to use dramatic effects of light and shadow for emotional, narrative or visual impact. In the *Christ in Gethsemane* miniature on fol.142v. of the *Très Riches Heures* (c.1411/12-16, Chantilly, Musée Condé) (Fig 3.25), the Limbourg Brothers set the scene not at dawn, as previous artists had shown it, but at night. The potential of light as a means of conveying mood and atmosphere is powerfully employed to indicate a subdued quietness. The miniature plausibly describes how the midnight blue sky throws the figures into a nocturnal darkness and how the flames of the lantern and torches illuminate nearby surfaces. For all its innovation, however, the image still seems more painted than real – although the flames light nearby surfaces, they do not apparently produce the strong cast shadows one would expect. Just slightly earlier than this, the Boucicaut Master also chose a dramatic lighting situation for his *Flight into Egypt* in the *Boucicaut Hours* (c.1410, Paris, Musée Jacquemart-



André. ms.2. fol.90v.) (Fig 3.26). The narrative is set in a landscape dominated by the sun rising over the distant hills, providing a primary internal light source. The sun's light appears to produce shadows on the underside of trees and a light yellow-green suggests leaves and blades of grass which catch the sun's golden rays. There are clearly parts of the landscape which are in shadow, such as the area under the trees to the left and both sides of the fence in the foreground, but these areas do not read explicitly as cast shadows. Moreover, they do not follow a consistent source of illumination, and whilst the sun is obviously the source of light within the image, forms and figures have their shadowed side facing the sun, implying a second source of light corresponding with the viewer's viewpoint. Whilst both of these miniatures show an innovative interest in the dramatic capacity of light, neither is concerned or able to suggest that each object within the image is subject to a consistent and plausible source of light.

In the late 1420s, Campin and the van Eycks (at around the same time) began to produce panels in which a very precise light source, independent from the viewpoint, was specified by means of highlights and shadows. Campin's *Trinity* panel (c.1428-32) (Fig 3.27) uses a plausible single light source falling at approximately 45° from the right to produce an entirely convincing trompe-l'oeil representation of sculpted figures. Perhaps just slightly earlier than this (probably before 1426),<sup>53</sup> Jan and Hubert van Eyck also adopted a 45° primary light source on the interior and exterior of the *Ghent Altarpiece* (Figs 3.28 and 3.29). In both works, the viewer is

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<sup>53</sup> We do not know when the *Ghent Altarpiece* was begun. I am inclined to subscribe to a date as early as c.1420. The size, complexity and quality of the altarpiece suggests that Hubert and Jan had probably been working on panels for the altarpiece for a number of years before 1426 when Hubert died. (Although these may not have been intended for the work in its present form when they were begun). What we know of Jan's work for Philip the Good also suggests that he would have had insufficient time to paint the whole altarpiece between 1426 and 1432 unless it was already partially completed before 1426. The failure to identify a distinguishable hand belonging to Hubert does not, in my opinion, justify attempts to write him out of his part in the execution altogether. Hugo van der Velden's forthcoming study, based on a new evaluation of documentary evidence, will address this issue.

convinced into believing that the figures have a real three-dimensional presence. The explanation for this effect has much to do with the kinds of shadow generated by lighting subjects from a lateral angle and the extensive description of these shadows that allows the viewer to easily recognise the position and intensity of a suggested light source.

Certainly van Eyck was not the first artist to employ a lateral light source: artists in Italy had made some use of this form of illumination on Tuscan fresco cycles over one hundred years before the van Eycks began the *Ghent Altarpiece*.<sup>54</sup> In northern Europe, however, lateral illumination was relatively uncommon before the 1420s and no surviving work suggests that any painter systematically employed a lateral light source. From about 1410, northern artists started to vary the direction of illumination. On the exterior wing panels of the *Norfolk Triptych*, for example (1410-15) (Fig 3.30), figures such as the two St. Johns on the lower left are painted with strong shadows on their right sides and strong highlights on their left sides, suggesting a lateral source of light to the left. As a group, however, the lighting of the figures is inconsistent as St. Luke is not visibly shadowed on any side and the artist does not take account of how light would be obstructed by the relative positions of other figures. (One would expect that St. Luke should block the highlighted side of St. Mark, producing a cast shadow, for example). Generally, light and shadow is a feature of individual forms, not a principle that acts consistently upon a scene containing multiple forms.

A consequence of lateral illumination, both with the perception of real objects and represented objects, is that the volume of an object is more readily perceived. The

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<sup>54</sup> This progression in Italian painting is treated in detail by Hills, 1987, who notes that Giotto established the convention of modelling highlights on the side of solids that face the largest window in the chapel. This practice is recommended also by Cennini in *Il Libro dell'Arte*, 8.

photographs **Figs 3.31** and **3.32** show the influence of frontal and lateral lighting on a ball. Objects illuminated directly from the front (**Fig 3.31**) will appear flatter as all the shadowed areas (the sides of a sphere for example) receive some proportion of light from the source ('penumbra'). The area in full (self) shadow ('umbra') remains unseen behind the object. Objects lit from a lateral position to the viewpoint (**Fig 3.32**) display areas in full illumination and full shadow and consequently have a strong tonal contrast which makes their three-dimensional aspect easier for the perceptual system to read. They appear to have a greater three-dimensional relief. Also, objects lit laterally produce cast and self shadows which are visible to the side of occluding objects (as opposed to being directly behind them as with frontally lit objects).

Campin's *Portrait of a Stout Man*, painted probably in the early 1430s,<sup>55</sup> (**Fig 3.33**) demonstrates a new fascination with how a lateral light source enhances the effect of three-dimensional mass by generating shadows and highlights with an extensive tonal range. The man is lit from a source to the upper right of the panel which causes strong modelling highlights to the (proper) right side of his face, dark self-shadow on the right side of his face and under the chin, and very dark cast shadows, such as the one generated by the subject's nose. On the level of micro-shadow, the man's stubble is articulated with dots of dark and light paint, indicating the tiny shadows cast by each hair onto the skin. Whilst the lighting accounts for the convincing impression of a physical mass, there is also a sense that the shadows are too dark and also somewhat heavy-handed. There is, furthermore, an incongruity in this image between the background and the subject. Whilst it is unclear whether the

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<sup>55</sup> Estimated felling date according to Klein, 1996 is c.1433. I subscribe to the opinion of De Vos, 1999, who sees the Madrid version as an original by Campin and the Berlin version as a copy by van der Weyden. Campbell, 1996 favours the Berlin version as Campin's original, but his view is, in my opinion, less fully substantiated.

white background is intended to be read simply as a flat, decorative area (as one usually finds in earlier portrait images) or as a wall behind the man, the shadows produced on the right of the man's face are not influenced by the space he inhabits. If the man was positioned in front of a white surface, as the image seems to suggest, a significant proportion of the light from the source to the upper right would be reflected by the white wall onto the shadowed side of the man's face. It is simply not possible for shadows to appear so dark if we are to understand that the man is standing before a white wall.

Between c.1425 and c.1435, portraits produced in the workshops of both Campin and van Eyck started to use a format which integrated the spatial setting with the dramatic modelling produced by lateral lighting. It is unclear whether van Eyck or Campin first devised the approach, but from late in the 1420s individual portraits produced by both artists are given black or dark backgrounds.<sup>56</sup> The *Portrait of a Man* (National Gallery, London), attributed to Robert Campin c.1435 (Fig 3.34), adopts the same lateral lighting as the *Portrait of a Stout Man* (except from the upper left side rather than the upper right). The same strong modelling highlights are rendered on the near side of the subject and very similar strong cast shadows are generated on the shadowed side of the face (from the nose and from the head onto the headwear, for example) as one finds in the earlier Campin portrait. In the later portrait, however, the strong shadows seem plausible in the spatial setting. As the background is dark, the shadowed areas, principally on the left side of his face and headwear, are not influenced by any reflected light from the spatial setting.

A very similar, but more sophisticated, method was employed by van Eyck in his individual portrait panels from as early as the 1420s. (The earliest is probably the

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<sup>56</sup> On the development of flat backgrounds, see Campbell, 1990: 112-15.

Bucharest *Man with a Ring* generally thought to have been painted c.1420-25<sup>57</sup> (Fig 3.35)). In all of van Eyck's individual portraits, the background is black or near black.<sup>58</sup> Whereas Campin's subjects are shadowed on their far side, van Eyck turns his subjects to face the light causing the near side of the face to be shadowed. In the portrait of *Jan de Leeuw* (1436) (Fig 3.36), the left (our right) side of the subject's face is in self-shadow which almost disappears into the dark background. Because the subject faces the light source, van Eyck avoids the long, distracting cast shadow caused by the nose on the Campin portraits. Instead, there are numerous smaller, more subtle shadows under the chin, around the ear and under the hand. Above all, one is left with the impression that the background is not simply decorative but actually a causal factor in the dark tonality of the shadows. Whilst evidence from surviving works makes it difficult to assess with any certainty whether the idea of integrating the dark background with the condition of illumination was an innovation of Campin or van Eyck, what is certain is that around 1425-35, portrait backgrounds become almost consistently black (or almost black) and shadows, generated by a lateral light source, become accordingly dark.<sup>59</sup>

Campin's use and understanding of shadows develops significantly in the short time between c.1415 and c.1425. The *Seilern Triptych* of c.1415<sup>60</sup> (Fig 3.37)

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<sup>57</sup> Belting and Kruse, 1994 date the panel 1420-25, Asperen de Boer, Ridderbos and Zeldenrust, 1991 suggest a date early in the 1420s.

<sup>58</sup> Natural ultramarine has been identified underneath the black paint on the *Portrait of a Man in a Red Chaperon (Self-Portrait?)*, perhaps indicating that the original background was blue rather than black. Campbell, 1998: 214.

<sup>59</sup> I am inclined to suggest that the innovation was Eyckian. This format is evident in all of van Eyck's surviving individual portraits (the earliest of these is the Bucharest *Man with a Ring*). Only three Campin-related works use the format (*Portrait of a Man* c.1435 and the accompanying *Portrait of a Woman* c.1435, National Gallery, London and *Man in Prayer* c.1430-35, Metropolitan Museum, New York).

<sup>60</sup> The attribution of this work to Robert Campin was first suggested by Bauch, 1944 and has been generally accepted since the 1960s. Kemperdick, 1997 believes this work was not painted by the same artist that painted the Frankfurt panels. It is not possible in the present context to examine the complex, often contradictory, arguments relating to the attribution of works to Robert Campin/the Master of Flémalle. I see no reason to doubt that the painting is an early work by Campin, as most scholars still agree.

describes cast shadows to supplement visual information about distance, depth and the direction of the light source. In the foreground, the bodies of Mary Salome and Mary Magdalene cast shadows onto the tomb, and shadows cast by their arms help to place their gestures more precisely in space. As the light source is just left of centre, there are, however, few visible shadows cast by the other figures. Whilst the foreground figures cast strong shadows on surrounding surfaces, no opportunity is taken to represent the shadows cast by outstretched arms holding objects such as the jar held by Mary Magdalene or the white cloth held by Mary, wife of Cleophas, or the staffs held by the angels. The *Nativity* (c.1420-25) panel (Fig 3.38) also describes shadows consistently and plausibly cast to the left of figures and objects such as Azel and her banderole in the foreground. Much like the *Seilern Triptych*, however, the crowded composition does not allow many cast shadows to be visible and the precise spatial relationship between objects and figures is often vague. The shadows provide no information, for example, about the relationship between the instrument held by the shepherd on the left and the arm of the shepherd to the right. By the time the *Mérode Altarpiece* (c.1425, but the wing panels are later) (Fig 3.39) and the *Nativity* were painted, cast shadows had become a key aspect of Campin's mode of description. In the *Mérode Altarpiece* Campin describes cast shadows produced by almost every object and surface in the room. He even correctly describes 'penumbral shadows' (which have a darker 'umbra' where light is blocked from both sources, around which a 'penumbra' is formed by the rays originating from just one of the sources) produced by the obstruction of light from the two windows to the upper left. The effect is, however, undermined by a number of inconsistencies such as the shadow on the wrong side of the left shutter and the suggestion that the two smaller windows on the

left wall dictate the fall of light and shadow as opposed to the larger window on the back wall.<sup>61</sup>

Van Eyck's understanding of cast shadow was even more sophisticated than one finds in Campin's later works. Whilst Campin used shadows to construct plausible spatial settings and objects with a strong sense of mass, van Eyck also used shadows to clarify the spatial relationship between objects. To indicate areas that are most intensely illuminated by the primary source, van Eyck employed darker cast shadows primarily around foreground bodies which get softer as they extend away from the object casting them. In the *Arnolfini Double Portrait* (Fig 1.3) cast shadows provide visual cues relating to the shape and distance of objects. The shape of the cast shadow on the bed (and also the facing self-shadow on the back of Mrs Arnolfini's dress) indicates the shape of the bed, and the dark tonality and the relative sharpness of the shadow edges clarify that the back of her dress just touches the lower part of the bed. To the lower left, the patens project penumbral cast shadows onto the floorboards, suggesting the presence of a second window (which is confirmed in the mirror) and confirming a dual light source (daylight) acting through two windows.

Van Eyck also took every opportunity to relate objects in such a way that each individual part of a form, no matter how small, casts the maximum number of shadows onto itself and surrounding surfaces. The figure of St. George in the *Virgin and Child with the Canon van der Paele* (Fig 1.4), for example, casts multiple shadows on surrounding surfaces. The use of multiple strong cast shadows throughout the panel, such as those cast by Christ's legs on the white swaddling cloth (Fig 3.40) and by Donatian's gloved left thumb onto his forefinger (Fig 3.41) provide repeated references to an intense light source (of fairly limited extension) to the viewer's left

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<sup>61</sup> This perhaps results from the larger window originally being gilt. See Ainsworth and Christiansen, 1998: 95.

just in front of the panel. As well as the shadow cast by George's feet on the floor tiles, his left arm casts a shadow onto the pole (Fig 3.42), indicting both a roundness of form and a proximity to his arm. The positioning of the saint's arm allows his hand to cast a small, dark shadow onto van der Paele's left shoulder (Fig 3.43), again clarifying the spatial relationship between his arm and the Canon's shoulder. Rather than positioning the flag held by the saint vertically (as Campin did with the staffs held by his angels), van Eyck slopes the flag pole so that the bottom edge is nearer the viewer. A consequence of this positioning is that the pole is allowed to cast both a visible shadow on the floor, free from the obstruction of the pole itself, and also a second extended shadow at the top of the pole on the arch, capital and column. Van Eyck repeatedly employs such small but relatively strong cast shadows as an important means of clarifying the spatial relationship between objects and the location of the suggested light source. Van Eyck was by no means the first to recognise that cast shadows contain spatial information. He was, however, more concerned than any earlier artist had been with manipulating the position of objects in relation to the light source so that he could make the maximum, repeated use of this effect.

### *Highlights and Lustre*

In addition to observing and imparting images with specific information about shadow, van Eyck also differentiated specific types of highlights as a means of conveying information about form, space and also texture (or, more correctly, 'microshadow'). In his treatment of highlights, van Eyck differed markedly from both earlier painters and also from his contemporaries. In his paper 'Light, Form and Texture in Fifteenth-Century Painting',<sup>62</sup> Gombrich notes how, in contrast to his Italian counterpart Domenico Veneziano, van Eyck succeeded in differentiating

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<sup>62</sup> Gombrich, 1993: 19-35.



between *lume* (illumination) and *lustro* (lustre). Gombrich's example makes explicit the broad contrast between the two fifteenth-century modes of realism – a mathematical mode common to most Italian paintings and an optical, light-driven mode common to northern, 'Eyckian' works. Whereas Veneziano in his *Saint Lucy Altarpiece* (c.1445) (Fig 3.44) suggests form through illumination, van Eyck suggests texture, primarily through the juxtaposition of specular surfaces against matt surfaces. Veneziano's use of highlights is restricted to 'modelling highlights' which denote the lightest tone in the gradation of light and shadow and are therefore only concerned with 'lume'. These highlights do not change their position if the observer moves (they are 'stable') and they take on the local hue of the object. In contrast to Veneziano, van Eyck uses both modelling highlights and also a second kind of highlight – the 'specular highlight' which denotes the lustre of a surface. These highlights move as an observer moves and at their most intense point, they take on the colour of the light source (usually white) irrespective of the colour of the object. The presence of specular highlights primarily informs the viewer about texture rather than form. As Gombrich rightly states, only in perceiving specular highlights and sudden tonal transitions that signify a glossy, lustrous material are we able to perceive a matt material such as the pile of velvet. It is primarily through the profusion of metallic and glass objects that van Eyck includes in his panels that he is able to suggest contrasts between surfaces and the visual aspects of their 'textures'. In turn, it is through the specific quality of 'specular-' (or 'lustre-') highlights that we most readily perceive the gloss of metal or glass.

As in his treatment of shadows, van Eyck used specular highlights not only to establish a visible scale of texture, as Gombrich noted, but primarily to describe how surfaces respond to a locatable light source. In total, the interior of the *Ghent Altarpiece* represents several thousand precious or semi-precious stones or pearls. (By

my count, the Virgin alone is covered with around 800 jewels. Most of these are pearls, but around 80 are either rubies, emeralds or sapphires). Specular highlights on each stone and pearl indicate a tiny mirror image of the light source to the right of the altarpiece. In doing so they provide information about the nature and location of the illumination. They provide an explicit acknowledgement of the existence of the space in front of the panel. As scholars have noted, Adam has specular highlights in his eyes (Fig 3.45) as he faces the light source whereas Eve, facing away from the light source, does not (Fig 3.46).<sup>63</sup> On the brooch worn by the foremost singing angel (Fig 3.47) the reference to the direct light from the window in the Vijd chapel is made so explicit that the large blue sapphire surrounded by pearls and rhombic emeralds is attributed with a specular highlight in the form of a window. Furthermore, the shape and colour of the highlights reflects the shape and colour of the light source – van Eyck therefore specifies that the light source is daylight and that it enters the chapel through a window to the right. (That this was considered an Eyckian conceit is suggested by Stefan Lochner's borrowing of this method of using specular highlights on shiny objects to indicate a specific external light source. (He adopted the same conceit along with a number of facial types and motifs from the *Ghent Altarpiece* as early as 3 years after this work was completed).<sup>64</sup>

Rather than suggesting the quality of metallic or transparent materials using paint alone, most panel painters and manuscript illuminators c.1400 used metallic foil or leaf (of gold or silver) or shell gold, occasionally in combination with paint, to suggest specular or lustrous surfaces. Typically metal leaf was used in a relatively straightforward manner to represent metallic objects, such as the gold and gilt

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<sup>63</sup> Wilhelmy, 1993: 71-75

<sup>64</sup> Chapuis, 2004: 193-214 argues that a gem worn by the Virgin on the *Dombild* (1442-45) reflects "one of the ogees of the Ratskapelle where the altarpiece originally stood". Chapuis suggests that this was a measure of Lochner's involvement with Eyckian art and that he was measuring himself against van Eyck.

tableware rendered with burnished gold in the January miniature (fol. 2r.) of the *Très Riches Heures* (Fig 3.48) by the Limbourg Brothers, or St. George's armour (fol. 23v.), rendered in silver leaf by the Boucicaut Master in the *Boucicaut Hours* (Fig 3.49).<sup>65</sup> It was also common for saints' halos and brocade fabrics to be shown with gold leaf. In the *Saint Ursula* miniature (fol. 376r.) of the *Châteauroux Breviary* (Fig 3.50), for example, the Bedford Master uses burnished gold on the halos of Ursula and her companions in the main miniature, but also reverses this technique in the decorated initial below, where gold provides a background for red and blue halos. Some miniaturists around this time – in particular the Limbourg Brothers and the Boucicaut Master – also used these materials in a more illusionistic manner. The Limbourgs, for example, used silver leaf with painted white highlights and coloured washes to suggest shimmering water in the *Saint Jerome Arriving in Constantinople* miniature (fol. 185r.) of the *Belles Heures of Jean, Duc de Berry* (c.1405-09, New York, Metropolitan Museum of Art, The Cloisters, Acc. No. 54.1.1) (Fig 3.51).<sup>66</sup> A number of miniatures from this period also use burnished or powdered silver to suggest light passing through glass windows. Occasionally, as in the *Ostentation of the Relics* miniature (fol. 350r.) in the *Châteauroux Breviary* (Figs 3.52 and 3.53), paint is also applied over the silver to indicate coloured glass.<sup>67</sup> Shell gold is also used quite frequently in miniatures by the Boucicaut Master to suggest the glimmer of natural or divine light. In the *Martyrdom of Saint Denis* miniature (fol. 364r.) of the *Châteauroux Breviary* (Fig 3.54), for example, gold is used to indicate light on the hillside and rooftops, and in the *Saint Michael on Mount Gargano* miniature (fol. 345v.) (Fig 3.55) in this manuscript, the same technique is used to describe

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<sup>65</sup> Guineau and Villela-Petit, 2002: 34.

<sup>66</sup> Lawson, 2005: 154.

<sup>67</sup> Villela-Petit, 2003: 124.

shimmering light on the distant ships and buildings.<sup>68</sup>

In the *Wilton Diptych* (c.1395-99), all goldsmiths' work, such as the crowns, is suggested with gold leaf alone. However, the gold is punched to produce a stippled effect in areas of highlight. Thick, raised dots of lead white, which appear three-dimensional in raking light, suggest the *ronde-bosse* enamel 'jewels' on the crowns and brooches (Fig. 3.56 shows St Edmund's crown).<sup>69</sup> In the *Antwerp-Baltimore Quadriptych*, the artist has glazed over silver leaf on the *Resurrection* panel to denote shadow on the soldiers' armour (Fig 3.57). The underlayer of silver imparts a different, more reflective optical quality to the armour. The silver leaf does not alone provide the suggestion of metal, however. Rather, the artist has attempted to control the way in which the silver responds to light by glazing paint over the areas that are supposed to be read as shadow. In doing so, he actually employs the silver specifically as a means of providing a bright highlight tone. As real light reflects the surface of the silver, those areas not covered by a glaze or covered with less glaze proportionally reflect most incident light, producing very bright tones that correspond with the intensity of specular highlights in the perception of real objects. This illusionism is however undercut by the reality of a moving observer and/or a moving light source such as a candle, both of which will cause the specular reflection to move also. Consequently, the real specular highlight will not always correspond with the suggested pictorial one.

Campin used a similar technique to the Antwerp-Baltimore artist to render some of the metallic surfaces on his *Seilern Triptych*. On the *Resurrection* panel, for example, the soldiers' armour and drapery are composed of gold leaf glazed primarily with a reddish-brown to model tone (Fig 3.58). Where Campin's use of gold and

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<sup>68</sup> Guineau and Villela-Petit, 2002: 35, 37.

<sup>69</sup> Gordon, Roy & Wyld, 1993: 49.

silver leaf differs from that of the Antwerp-Baltimore artist is that in other areas of the same panel metallic surfaces are rendered entirely in paint. For example, whilst mordant gilding was used on the gold breast-plates of the startled soldier, the chains hanging from the plates were painted in lead-tin yellow over a dark brown paint layer which looks similar to mordant (Fig 3.59).<sup>70</sup> Likewise, the armoured leg of the same soldier (Fig 3.60) was painted using azurite and lead white rather than silver leaf.<sup>71</sup> Although it was undoubtedly easier to paint certain areas (such as the soldier's chains) than to gild them, there does not appear to be any overall logic, beyond perhaps a taste for optical variety, behind which areas employ paint alone and which employ gilding. Campin uses gilding, however, only on small areas and flat surfaces where the contradiction of real and pictorial specular highlights is less intrusive to the illusion of modelling. Significantly, only shadow tones are applied over the gilding which acts exclusively as a highlight tone as it does in the Antwerp-Baltimore panel.

The gilded areas on the *Ghent Altarpiece*, on the thrones of the upper register Deësis figures and on the floor tiles (Fig 3.61), likewise treat the metallic foil as a highlight tone over which glazed paint is applied. On the thrones, brown shadow tones were glazed over the gold, and on the tiles, translucent green and red glazes were applied over the silver.<sup>72</sup> As both the thrones and the tiles are relatively flat surfaces, the use of the foil as a highlight tone does not interfere significantly with a concern for modelling. Elsewhere on the altarpiece, paint alone is employed to indicate all specular surfaces including gold. By the time the *Ghent Altarpiece* was finished in 1432, both Campin and van Eyck had replaced the use of gilding entirely

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<sup>70</sup> Villers and Bruce-Gardner, 1996: 29-30.

<sup>71</sup> Villers and Bruce-Gardner, 1996: 29-30.

<sup>72</sup> van Asperen de Boer, 1979: 165-69.

with the use of paint alone.

Apart from their sensitivity to movement, the most important visual quality of specular highlights is that, as tiny mirror images, they reflect almost all the light from the light source. They are consequently always the brightest parts of what we see in our perception of the visual world. This was conversely the weakness of earlier panels where gilding was employed, as the position of real silver in the tonal scale was changeable. However, silver was also, under the correct condition of illumination, capable of producing much brighter specular highlights than is possible in paint. Alberti recognised the limitation of representing the brightness of specular highlights in a passage from *De Pictura* in which he warns against using too much white. He rightly notes that white is the only means that the painter has of suggesting the brightest parts of an image:

Nam habet pictor aliud nihil quam album colorem quo ultimos tersissimarum superficierum fulgores imitetur, solumque nigrum invenit quo ultimas noctis tenebras referat.<sup>73</sup>

By following this same principle van Eyck was able to distinguish tonally between diffuse highlights, used primarily to signify the form and texture of matt surfaces, and specular highlights, used to signify similar information about specular surfaces. In all van Eyck's paintings, the use of white and near white tones is limited almost exclusively to the rendering of highlights on specular surfaces ("lustre highlights"). Although the white or pale yellow paint van Eyck uses in these areas reflects considerably less light than real silver or gold (and therefore does not appear

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<sup>73</sup> Alberti, *De Pictura*, 2.47, 90. "For the painter has no other means than white to express the brightest gleams of the most polished surfaces, and only black to represent the deepest shadows of the night." Translation from Grayson, 1972: 90-91.

as bright), in relative terms it is always brighter than all the other tones used for light surfaces in the image. Consequently, within the overall tone of the painting's visual field, white specular highlights appear to gleam in contrast with all other tonal highlights. On the *Rolin Virgin* pure dots of lead white feature like tiny crystals on the crown (Fig 3.62), on the orb held by Christ and even on some of the flowers outside where the rising sunlight appears to reflect the morning dew. White and pale yellow is also used on the front faces of the polished capitals, polished marble columns, shot silk brocades (Fig 3.63) and in the bull's-eye glass. Only very rarely is white used as a local colour and where it is used, it is usually toned down with the admixture of another colour. (Fig 3.64 shows Canon van der Paele's white surplice which contains a blue-grey colour and a tan colour, for example).

In the same way that van Eyck employed usually white opaque paint to denote the specular highlights on transparent and colourless objects, he used an identical technique to denote metallic surfaces, from expensive goldsmiths' work to candlesticks and shot silk fabric. For all metallic surfaces the illusion of specular lustre relies on the placement of usually pale yellow opaque paint. As these areas are almost the same tonally as the white highlights, they also appear similarly bright in relation to almost all other surfaces on his panels. Surprisingly, van Eyck's technique was both simple and systematic. For surfaces of polished gold or brass such as St. George's armour (Fig 3.65), usually just two colours, a dark brown and a yellow-brown, are blended into each other. Opaque, pale yellow paint is then added to the edges where highlights are required. Often, as in St. George's armour, streaks of colour relating to surrounding objects are added to denote reflection from these objects. For brocades such as that worn by St. Donatian, the system is the same: an underlying (usually reddish-) brown paint is set down over which pale yellow

diagonal lines and stippled dots denote specular highlights.<sup>74</sup> In areas of greater reflection, the lines are slightly thicker and the density of dots is increased. For Gabriel's brocade dalmatic in the Washington *Annunciation* (Fig 3.66 shows a 7.7xM micrograph) van Eyck used the same system of pale yellow dots and streaks over brown, but in order to suggest the lattice of threads, he also dragged strokes of black through the wet yellow paint.<sup>75</sup>

As a comparison between the pearls and gemstones worn by the centurion on Campin's *Thief on the Cross* (Fig 3.67) and the similar morse worn by a singing angel on the *Ghent Altarpiece* (Fig 3.68) clearly shows, van Eyck's use of white was more sophisticated and more concerned with differentiating between lustre highlights and modelling highlights than was Campin's technique. In terms of the level of observed detail, there is little difference between the two examples. In Campin's image, however, the brightest highlight on the pearls is tonally the same as the bottom of the centurion's headscarf, the left (our right) side of his shirt, Christ's loincloth and the lighter parts of Christ's skin. Furthermore, each of these areas has been modelled with increasing proportions of admixed, opaque lead white in the lightest areas. Consequently, the specular highlights on the pearls are tonally the same as the other aforementioned areas and also physically constructed using the same or a similar combination and thickness of pigment. In comparison, the highlights on the morse stones and pearls of van Eyck's angel are tonally brighter than anything else around them. The only other areas of opaque white are highlights (also specular) that indicate the shine of the skin on the angels' noses and the glossiness of their teeth and some very fine lines on the folded edges of the white collars (which are mostly pale pink in fact). Van Eyck's technique for rendering the gemstones involved glazing over an

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<sup>74</sup> Ainsworth, 1994: 55 and 58-59.

<sup>75</sup> Gifford, 1999: 108-09.



underlayer modelled with the colour of the stone and some lead white with a glaze of the same colour.<sup>76</sup> Consequently, when a dot of opaque white is placed to indicate highlight on an area such as a gemstone which has been modelled in this way, the white dot responds differently to those areas covered with a glaze. Not only is the opaque white brighter than the lightest parts of the coloured, glazed area of the stone, it also rests physically above it, as it would in reality where the highlight appears to sit on the surface of the stone.

### *Illumination*

I have so far considered specific aspects of van Eyck's approach to highlights and shadows individually. It is in considering their part in the broader concerns of illumination and luminance, however, that one is able to understand how his distinctive approach to light operated. The most important general characteristic of van Eyck's approach to illumination was the way in which he integrated real light and pictorial light by including descriptive references to both the direction and the intensity of suggested light sources. In the *Annunciation* panel on the exterior of the *Ghent Altarpiece* (Fig 3.29 and 3.69), direct light from an origin to the right side of the viewer's space generates both specular highlights on lustrous surfaces and cast shadows produced by the apparent obstruction of the vertical frame mouldings which fall on the tiled floor. If we look more carefully at the behaviour of light throughout this panel, however, there is a discrepancy between the cast shadows produced by the frame and the direction of the sunlight outside which comes from the left. It is simply not possible that the figures in the foreground of the interior could be lit from the sunlight outside. What van Eyck suggests here makes explicit what is also

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<sup>76</sup> Coremans, 1953: 71.

consistently suggested in his other panels: light from a window to the side of the viewer's space is almost always apparently the primary light source acting on the foreground space of the panel. The background space is, however, subject to an internal source of light.

Most of the earliest examples of northern paintings that use an implied light source outside the panel (and separate from the viewpoint) occur on 'grisaille' panels (or altarpieces containing 'grisailles') made for specific sites from the 1420s. Of those that still survive, the 'sculpted' figures of John the Baptist and John the Evangelist on the exterior of the *Ghent Altarpiece* are the earliest examples for which their original setting is known. When the altarpiece is closed, these trompe l'oeil figures appear to be illuminated by the light from the chapel windows, apparently producing highlights to the (our) right of their forms and shadows to the left. The correspondence with the direction of shadows and highlights in the chapel itself makes these figures seem convincingly three-dimensional as though they are literally illuminated by real light.

On a practical level, grisailles were ideally suited to the new-found concern with the observation of highlights and shadows. As the imitations of sculpture represented by van Eyck and Campin appear to represent unpainted, almost monochromatic materials (like sandstone, ivory and marble) with only a tint of colour (usually yellowish), the importance of replicating light and shadow is necessarily increased as the option of using colour to refer to space or texture is removed. Conversely, having dispensed with the use of colour almost entirely, the task of observing the condition of light is considerably more straightforward if considerations such as relative chromatic values and the placement of colours no longer need play a role in the observation and rendering of the subject. For the observer too, a monochromatic subject makes the practice of interpreting the image more straightforward. In a full-colour image, as in real life, the brain must decide whether

sudden changes in tone such as bright highlights or cast shadows are caused by a physical change (in colour, material or surface) or by a condition of light – whether for example a dark patch on a light surface is a stain or a projected shadow. Perception of shape, past experience and tone gradation all play a major role in this process. To an audience unconditioned to the language and logic of cast shadows in images, the removal of colour increases the possibility that changes in tone are a condition of light rather than a condition of the object.

It is unfortunate that we do not know the original settings of most of Campin's 'grisaille' and fictive stone paintings such as the *Trinity* (c.1428-32) panel (Fig 3.27), *John the Baptist* (c.1428-32) (Fig 3.70) on the reverse of the *Thief on the Cross*, or indeed the 'Campin group' *St James the Elder and St Clare* (Fig 3.71) on the reverse of the *Betrothal of the Virgin* panel (c.1435-40).<sup>77</sup> Like the figures on the *Ghent Altarpiece*, these also use a 45° source of lighting which produces a strong illusory sense of physical mass. It is also likely that these were originally part of large-scale altarpieces, presumably made for particular sites, at around the same time that van Eyck was working on the *Ghent Altarpiece*. It is not unreasonable to suppose that these might also have been painted for side chapels and that both Campin and the van Eycks were experimenting with similar ideas of trompe l'oeil fictive sculptures which apparently responded to real light.

Although there is little evidence relating to the original settings of Campin's panels, we can be relatively certain that van Eyck was using the integration of real and pictorial light to enhance the realism of not just grisaille figures but entire compositions. It is surely beyond coincidence that three of his largest paintings – the *Ghent Altarpiece*, the *Virgin and Child with the Canon van der Paele* and the *Rolin*

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<sup>77</sup> The *Betrothal of the Virgin* and the grisaille on the reverse are apparently by different hands but both are generally thought to derive from an original by Campin. Garrido, 1996: 62-66.

*Madonna* – each imply a light source outside the panel corresponding with the direction of real light from windows in their known or most likely original settings. The Vijd chapel is the most straightforward example. The church actually faces East-South-East and the two windows in the chapel (which form the two outer sides of a pentagon) face South and South-West (Fig 3.72). In its original location, the position and direction of the depicted shadows and highlights would have broadly corresponded at all times during daylight hours with the shadows and highlights of real objects in the chapel. Although this effect is most striking with the larger figures on the exterior, both registers of the interior also suggest a light source from this same fixed position. The primary source of light acting on the altarpiece in the otherwise dark chapel would have been daylight that arrives through the two large chapel windows. For much of the year, the light that arrives through these windows for most of the day is reflected light and so the direction of the light acting on the panels would not have been governed by the position of the sun, but primarily by the position of the windows and walls of the chapel in relation to the altarpiece.

The original positions of the other two paintings are less certain, but Figs 3.73 and 3.74 show their most likely positions, based on the known evidence. A recent study by Maximiliaan P.J. Martens<sup>78</sup> has shown that van der Paele's panel is most likely to have been positioned in a side chapel, dedicated to Saints Peter and Paul, in the south side aisle of St. Donatian's. As the choir of St. Donatian's faced east, light would have entered the chapel primarily through the south-facing window (Fig 3.73). If we accept Martens's argument that the panel was intended as an epitaph and that it is likely to have been not on the wall by the altar,<sup>79</sup> but on the opposite wall (facing

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<sup>78</sup> Martens, 2005: 366-77.

<sup>79</sup> A document states that another retable (a triptych) was on the chapel altar in 1439. The document, quoted by Martens, 2005: 374 reads, "Item pro mundatione tabule exterioris ad altare apostolorum petri et pauli VI s par". (Item for cleaning the exterior side of the retable on the altar of the apostles Peter

east), the direction of depicted light (which comes from the left) would correspond with real light from the chapel's window. In the case of Rolin's panel, it is generally thought that the painting was originally positioned near the altar in the chapel of St. Sebastian in the church of Notre-Dame du Châtel, Autun (Fig 3.74).<sup>80</sup> An arcade connected the chapel on its north side with the choir and windows were positioned on the east and south chapel walls. We might reasonably assume that the altar was positioned beneath the window on the east wall, since other altars in the church faced east. As Anne van Buren has argued, it seems that the most likely position of the panel would have been on the wall behind the altar to the left, or perhaps even on the altar.<sup>81</sup> On or near the altar, the depicted light which comes from the right would correspond with the real light from the window in the south wall. The light from the window behind the painting would not influence the direction of the pictorial light. (Real objects in the room placed near the west and north walls would have penumbral shadows, produced by the influence of two light 'sources'. This would not apply to objects placed near to the east wall however). Again, from what we know of the most likely position of the panel, the direction of pictorial light appears to have been designed to correspond with the position of windows in the spatial setting.

Although van Eyck's paintings must have appeared to actually respond to (primarily reflected) daylight in their original settings, we must be careful not to overplay how specific these relationships were in technical terms. Rather, I would argue that van Eyck employed a fairly consistent approach to lighting which allowed

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and Paul, six shillings of Paris). See also Chapter 1, n.113.

<sup>80</sup> The first mention of the painting, in a description of the church written by an anonymous visitor in 1748 (based on notes taken in 1705), locates it in the chapel. This description, along with a plan of the former church of Notre-Dame du Chastel dating from 1773 is discussed by van Buren, 1979: 631-33.

<sup>81</sup> van Buren, 1979. This view is supported by Lorentz, 2000: 52. Certainly the north wall is unlikely as this was dominated by the open arcade apart from about five feet at its end. Adhémar, 1975: 17 favours the west wall on the grounds that other objects, including statues of the saints, are known to have been on the altar. His argument does not preclude the panel from being placed on the east wall however.

this effect to be successfully engineered. As foreground objects and figures in van Eyck's panels are quite consistently lit from around 45° from the left or right, it seems that his practice involved systematically lighting each of his subjects, probably from a single window, at as near to this angle as he was able. This would allow him to observe models or objects individually and then to arrange them in composite images with a reasonable consistency of illumination. Also between different panels, comparable objects tend to have very similar qualities of light and shade. The pictorial light of the *Ghent Altarpiece* is no different, for example, from the observation and rendering of light employed in the *Washington Annunciation*. If we compare the foremost singing angel on the left side of the Ghent panel with Gabriel on the left side of the Washington panel, the implied light source is identical (Fig 3.75). Both faces show an almost identical distribution of highlight and shadow with specular highlights in corresponding positions on the nose and forehead. Specular highlights are placed in the top right of each pearl and gemstone, reflecting the light source. Gabriel even wears a morse with a sapphire in which a window is reflected, as one finds in the sapphire of the Ghent angel's morse (a reflection of the window in the Vijd chapel). Likewise, the stool in the foreground of the Washington panel casts shadows onto the floor at approximately 40-45°. Despite the difference in the form and the effect of foreshortening, the stool the angel sits on to play the organ in the Ghent panel casts shadows of a similar shape from the legs onto the floor at the same angle (Fig 3.76).

One finds the same angle of illumination and shadow (or the exact opposite) throughout van Eyck's panels with only a slight variation in the angle of no more than 10° or so. Although there is a considerable difference in size, the small alabaster figures of Gabriel and the Virgin on the *Thyssen-Bornemisza Annunciation* (c.1437-39) (Fig 3.77) and the monumental fictive stone figures of John the Baptist and John the Evangelist on the *Ghent Altarpiece* (Fig 3.29) appear to be lit from a very similar

light source. Both sets of figures display the same tonal range with the right side of each form in very strong highlight and the left side in strong shadow. (The three different tones on each of the visible faces of the pedestals show the similarity between the intensity and direction of light very clearly). In both examples, cast shadows fall in similar positions to the left of each figure and shadows cast by the lower edges of the architectural mouldings and by the pedestals fall at angles of between  $35^{\circ}$  and  $45^{\circ}$ . (The size of the Thyseen-Bornemisza panels makes it difficult to measure these angles precisely). Significantly, the angles of the shadows cast on the floor of the niches on the *Ghent Altarpiece* vary between the above values, suggesting that they were not calculated according to a specific light source, but intended to correspond more approximately to an angle of around  $45^{\circ}$ .

The lighting in van Eyck's work is so consistent that several figures in different paintings are described with the same combinations of highlights and shadows, despite being placed in quite different positions within their respective compositions. In the *Virgin and Child with the Canon van der Paele*, for example, the light that falls across the Virgin's head (at around  $45^{\circ}$ ) is an almost identical reversal of the description of light used on the Virgin in the Washington *Annunciation*. If we compare a reversed image of the Washington Virgin with the Bruges Virgin (Fig 3.78) the use of self shadow and cast shadow corresponds exactly, and highlights are located in the same positions on the nose and forehead and outlining the contour of the cheek and neck. Significantly, the implied location, extension and intensity of the light source remains the same (but reversed) in both examples, even though one figure is positioned in the centre of a panel and another is positioned on a left wing panel. There are numerous examples of figures (compare the head of the *Lucca Madonna* (Fig 1.1) with the head of St. Catherine on the *Dresden Triptych* (Fig 4.85), or the head of the Virgin on the *Rolin Virgin* (Fig 2.10) with the Virgin on the Thyssen-

Bornemisza *Annunciation* (Fig 3.77), where there is not only a similarity in form but also a correspondence in illumination, irrespective of where the figure is placed along the horizontal axis. (There is a natural correspondence of position on the vertical axis as figures invariably sit or stand on the floor). The suggestion is that van Eyck used a consistent approach to lighting in all aspects of his practice, presumably so that existing studies or model drawings could be easily integrated, adapted and re-used in different compositions.

The effect of associating pictorial light with the condition of light in a specific location was undoubtedly more effective in large-scale works that incorporated trompe l'oeil elements than in smaller works designed to be viewed at close range. It is not unreasonable to suppose, however, that some of the smaller works (such as the Thyssen-Bornemisza *Annunciation* and the *Virgin in a Church* and most of his portrait panels), although potentially portable, were also perhaps designed with a favoured location, either in a domestic space or small chapel, in mind. Like the larger works, these may also have been displayed in positions that allowed their pictorial lighting to apparently correspond with the conditions of illumination in their setting.

### *Luminance*

Van Eyck's paintings differ most dramatically from earlier and contemporary paintings in their exceptional sensitivity to differing levels of light (luminance) between different areas of the image field. With only a few notable exceptions (the interior of the *Ghent Altarpiece*, the New York *Crucifixion*, the *Virgin by a Fountain*), the majority of van Eyck's paintings depict figures inside architectural spaces. Artists of the preceding generation usually opted to set their figures either in the open 'landscape', entirely inside architectural structures, or in an ambiguous shallow space. Other more ambitious artists sought solutions to show narrative simultaneously



indoors and outdoors (with varying success). In each case, the conditions of lighting are given little if any consideration. In Broederlam's *Crucifixion* wings (1393-99) (Fig 3.79) for example, a continuous narrative takes place alternately indoors and outdoors, but there is no distinction made between the darker lighting conditions indoors and the daylight outdoors. Illumination is considered to be uniform, with its origin implicitly in the viewer's space, as opposed to the depicted space. Although Broederlam is typical of his generation, one of the few exceptions to the ignorance of differing light levels between interior and exterior is the *Calvary of the Tanners* panel of c.1400 (Fig 3.80). In this painting, illumination is, as in Broederlam's paintings, relatively uniform. However, the two chapel-like structures at each side of the composition are shown with dark interiors, indicating a clear distinction between interior and exterior light levels. Despite observing the differing conditions of light, however, the artist fails to observe that the windows inside the building should appear bright, not dark. Furthermore, the artist does not show any interest in showing objects or figures inside the interior spaces, observed in the condition of a darker space. The two female saints (Barbara and Catherine), although apparently standing inside the entranceways, are treated in the same manner as the rest of the figures who are apparently standing in daylight outside.

In contrast to earlier painters, van Eyck repeatedly described settings in which a visual contrast is established between the level of illumination inside and that perceived outside. Excluding portraits, six out of van Eyck's eight remaining painted panels describe brightly lit figures inside relatively dark interiors (*Arnolfini Double Portrait*, *Lucca Madonna*, *Van der Paele Virgin*, *Rolin Virgin*, *Washington Annunciation*, *Ghent Altarpiece Annunciation*). Either behind the figures on the back wall (in four examples) or on the side wall to the left (in two examples) is a window or opening through which the daylight outside provides a stark visual contrast with

the interior space. The *Rolin Virgin* (Fig 2.10), most obviously, is so effectively built around the sensation of looking from a dimly lit room into a sunlit landscape that one might reasonably argue that for van Eyck this effect must have been the real subject of the panel.<sup>82</sup> (The popularity of the compositional format of the interior looking out over a landscape is suggested by the later *Rothschild Madonna* and *Exeter Madonna* by Petrus Christus and, of course, the roughly contemporary *St Luke Drawing the Virgin* by Rogier van der Weyden. None of these panels, however, display the same interest as van Eyck's in representing the discontinuity of illumination.) Physiologically, the viewer has the sensation that real light is travelling outward from a point beyond the interior space (and also somehow beyond the panel itself). The intensity of the light, however, appears to be relative, as the interior is affected only by dim, reflected ambient light. In addition to the light generated by the pictorial window, however, the figures are lit by a second light source in front of the picture frame which softly but brightly illuminates the figures from a point to the top right behind the viewer (around 45-50°). The light therefore informs us spatially, suggesting the existence of a second large opening behind us (which we presume mirrors the visible loggia form). For example, as the Chancellor and the Virgin are not subject to the same slight silhouetted effect as the architecture behind them we infer a source of light behind us to the right, accounting for their relative brightness within the dark interior. In the case of the *Lucca Madonna* (Fig 1.1) and the *Arnolfini Double Portrait* (Fig 1.3) the source of the light is made explicit – daylight from windows in the left wall. In these cases, however, it is not the depicted window through which the strongest light falls but a second window implicitly in the viewer's space. (In the *Arnolfini* panel this second window is shown in the mirror). Because the overall

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<sup>82</sup> This point is suggested by Pächt, 1999: 85.

tonality of the paint is darkened behind the figures, we infer that the light is less direct, consisting of reflected (ambient) light.

Most paintings from the late fourteenth to the early fifteenth centuries have a foreground source and a background source of light but rarely do they combine these sources into a plausible lighting scheme. The Boucicaut Master's *Flight into Egypt* (Fig 3.26) mentioned above, for example, uses an internal source in the form of the sun to illuminate the landscape and an implied external source corresponding with the viewpoint to illuminate the foreground. Likewise, Campin uses two light sources in his *Nativity* (Fig 3.38) in which the light from the sun at the upper left causes cast shadows to the right of objects. The area in front of the stable, however, is illuminated by a second source to the right which casts shadows to the left of (some of the) objects. Like the Boucicaut illumination, Campin's background source is internal to the image and the foreground source is apparently external. Whilst this method of illumination imparts greater significance to the presence of the viewer's space and the condition of light within it, it also introduces an optical vagueness that reads visually as an inconsistency – it is unclear at what point in the depicted space the illumination of the sun gives way to a brighter illumination from the viewer's space. Most likely, Campin did not consider the sources of light quite so carefully, and the foreground illumination probably derives from a conventional expectation (shared by the Boucicaut Master) that the viewer should be able to see the figures and objects in the foreground clearly. In contrast, by suggesting a source of relatively dim ambient light within the panel and a second brighter source acting on the foreground from outside the panel, van Eyck integrated two distinct sources of light into an optically plausible space.

At least two of van Eyck's surviving works – the *Ghent Altarpiece* and the *Dresden Triptych* – employ two distinct modes of colour that refer to a symbolic progression from exterior to interior and earthly to heavenly. One of the most striking and most frequently-noted visual aspects of the *Ghent Altarpiece* (Figs 3.28 and 3.29) is the contrast established between the bright, saturated colours of the interior and the muted, brownish colours of the exterior. Much of the comment on this fact has sought to explain this relationship in terms of a liturgical colour code whereby bright colour, it is suggested, related to feast days and Sundays and the 'grisailles' related to weekdays and Lent.<sup>83</sup> According to the church calendar, a winged altarpiece could be opened to display its 'feast-day side' (Feiertagsseite) or closed to display its 'everyday-side' (Werktagsseite). In this context, it is argued, the viewer's progression to colour corresponds with the progression to a more devotional state of mind or at least signifies an increased solemnity of occasion. In the act of opening the altarpiece, the contrast between the partly de-saturated brown-grey hues the viewer is attuned to and the intensely-saturated unmixed hues of the interior requires a physiological adjustment to a different scale of colouring. In addition to the difference in colour saturation, corresponding colours on the inside of the altarpiece also appear brighter, so the green worn by Micah and the Cumaean Sibyl, for example, is not just less saturated than the green worn by John the Baptist on the interior, it is also less bright (Fig 3.81 shows this comparison).<sup>84</sup> There is the illusion that the difference in brightness is caused by a difference in the intensity of illumination which allows surfaces on the interior to reflect (pictorially) more light and therefore appear brighter

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<sup>83</sup> For example, de Mey, 2001: 89-114; Philippot, 1966: 225-242; Preimesberger, 1991: 459-489 and Smith, 1957-59: 43-54.

<sup>84</sup> This point is based on my own observation of the painting in its present location, not on evidence from pigment analysis. The difference appears to be the result of one or more different pigments and/or differences in layer structure.

than similar surfaces on the exterior. More specifically, the suggestion is that the predominantly brighter colours of the interior are logically a condition of the illumination outdoors and that the mostly darker colours relate to a condition of light indoors, corresponding with the interior setting of the *Annunciation* and also the physical setting of the altarpiece in the chapel.

In addition to being darker than the outdoor scenes, the colours used in the *Annunciation* scene are also much warmer, dominated by orange-brown hues. We read the clothing worn by the Virgin and Gabriel as white, despite the actual pigments used consisting of mostly tan-orange hues.<sup>85</sup> It is presumed that the condition of reflected light inside the room bathes everything in a subdued warm light. In contrast, everything on the *Adoration of the Lamb* panel is lit with a white light that renders colours more in accordance with bright daylight (Fig 3.82 shows a detail from the *Annunciation* compared with a detail from the *Adoration* panel). In van Eyck's other works too, there is a similar distinction between the foreground area in which bright unmixed colours are rendered as though in full daylight whilst the interior behind is dominated by the warmer tan-brown hues of ambient interior light, reflecting the stone architecture.

It is significant that van Eyck never places objects or figures in the dimly lit space (usually located near the rear wall) as a means of articulating a visible progression from direct to ambient light. Rather, the warm hues of the architectural setting itself imply a condition of light that is not reflected on the visible side of objects and figures in the foreground. As the figures and objects in the foreground are rendered using either a reflective under-layer containing lead white or, in the case of specular surfaces, contain thickly applied white paint (tinted with yellow usually), the suggested light appears to approximate the neutral-white appearance of bright

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<sup>85</sup> Also based on my own observation of the painting.

daylight. Inside the interiors, however, colours appear uniformly warmer in hue as well as correspondingly darker in tone. Whilst the interior spaces are indicated with the use of some admixed white, the resulting hues are mostly warm brown tans with some occasional passages of orange, olive or yellow hues on the lighter-toned surfaces (see, for example, Figs 1.4, 3.69 and 3.100) Whether this was intended to refer to a tan stone colour or a perceived condition of the warmer hues generated by lower levels of illumination (or more probably a combination of the two), the visual effect asserts a relative difference in colour between the mostly reflected light of the stone interiors and the direct neutral white light of daylight from a source outside the panel acting on the foreground. It is by virtue of the white reflecting layer contrasting with the opaque, warmer hues of the space that such a reference to daylight is successful.

As the foregoing analysis suggests, the mode of naturalism van Eyck developed was based on a new sensitivity to how light conveys information about space, texture and form. What van Eyck introduced through his work was more than a series of stylistic developments, however. Whereas earlier artists had used descriptions of light as far as it informed the shape of individual objects, van Eyck proposes that light has a far more important role in image-making. His paintings are not simply descriptions of objects, but descriptions of how light responds to those objects. In pursuing a means of translating this kind of description into paint, van Eyck also sought to generate comparable effects of light in his paintings. In doing so, his paintings also demonstrate an entirely new awareness of how paint can be manipulated not only by modulating tone and hue but also by controlling the sensation of real and apparent luminance, reflected and re-reflected from different surfaces.

### 3.3.2. Generating Luminance

The single most significant aspect defining the optical character of van Eyck's paintings is their unique ability to suggest that they not only *describe* optical effects but actually *reproduce* them. At their simplest and most fundamental level, Eyckian paintings suggest that images can be constructed and read primarily in terms of differing intensities of light. By generating the sensation that objects in the image each have a distinguishable luminosity as well as colour and form, the surface of his paintings assert a perceivable responsiveness to light. Furthermore, viewers are aware that part of the three-dimensional information they contain is reliant on real light. This section describes some of the processes through which van Eyck generates this sensation of luminance by manipulating the translucent quality of the oil medium in an entirely new way.

#### *Luminance Contrast*

Tonal contrast in van Eyck's paintings appears much closer to what we perceive in mirror images and retinal images than one finds in the work of earlier artists and also many of his contemporaries including Rogier van der Weyden. There is no obvious disjunction between the way in which we experience light in the real world – as it is continually reflected, refracted and obstructed producing a range of light and shadow – and our experience of looking at this same phenomenon in one of van Eyck's paintings. In perception of the real world, this aspect of vision is expressed in terms of a 'luminance contrast' value (the ratio between the measurements of the least reflective parts and the most reflective parts of a given image field). In practical terms, this value is translated into paint through the tonal contrast between dark and light pigments. In painted images, it is only possible to describe contrasts in luminance with a maximum ratio of around 1:40. In real life,

however, the intensity of light is such that the brightest part of a sunlit view can be up to 1 million times brighter than the darkest shadow (1000000:1).<sup>86</sup> With the exception of vision itself, the only images which have luminance contrast values of hundreds, thousands or even a million to one are those produced by spectral reflectance.<sup>87</sup> Even a mirror which reflects only 50% of the light acting upon it will still display a luminance contrast of tens of thousands to one.

Given that artists since as early as the thirteenth century had employed broadly the same materials and techniques as van Eyck, one would expect that this physical limitation would prevent artists from replicating the luminance of a scene as it appears to us in reality and in mirror images. Certainly artists around 1400 were far from achieving anything close to this tonal contrast. In fact, in most paintings of c.1400 such as the *Antwerp-Baltimore* panels (Fig 3.1), the tonal range of the image is concentrated in the midtone and highlight areas. Even though these two examples are painted in different media (tempera and oil), the aesthetic is quite similar. Neither work demonstrates any concern with showing a full range of tonal contrast from darkest shadow to lightest highlight. It was simply not a concern of artists at this time to replicate contrasts of luminance as they are perceived in reality.

It is worth noting at this point that mirrors not only produce relatively stable images with high luminance contrast values, they also demonstrate how reality might be translated into values of luminance which we read as light and shade. It is surely significant in this respect that Alberti's recommendation in *De Pictura* (1435) that artists should check their paintings with the advice of a mirror is given at a point in the text dealing with the observation and replication of light and shade. After advising the painter to pay particular attention to surfaces clothed in light and shade, he

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<sup>86</sup> Values taken from Hochberg, 1979: 24.

<sup>87</sup> This point is noted by Haber, 1979: 93.



suggests (in the passage cited earlier in the chapter) that the painter should add black and white (very sparingly) to corresponding areas of shadow and highlight in the painting. He goes on to suggest that a mirror will aid this procedure:

Nam hac nigri et albi conlibratione, ut ita dicam, surgens prominentia fit perspicacior. Dehinc pari parsimonia additamentis proseguere quoad quid satis sit assequutum te sentias. Erit quidem ad eam rem cognoscendam iudex optimus speculum.<sup>88</sup>

During the 1420s, works of the Campin school began to consistently employ the maximum range of available tones from pure lead white to pure bone black in a concerted attempt to use a full tonal range that at least attempts to correspond more closely to contrasts of luminance perceived in reality. Although Campin used a greater range of tonal contrast than artists of the previous generation, it is only in van Eyck's work that tonal contrast begins to suggest an equivalence to the luminance contrast typical of what is perceived in reality and spectral images. Bearing in mind that van Eyck used the same materials as Campin, how was van Eyck able to suggest that his paintings have a greater luminance contrast than works by earlier and contemporary panel painters? The answer, as the following analysis will demonstrate, has much to do with the way that van Eyck manipulated the material and optical qualities of oil paint to equate with sensations of luminance.

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<sup>88</sup> Alberti, *De Pictura*, 2,46, 88. "With such balancing, as one might say, of black and white a surface rising in relief becomes still more evident. Go on making sparing additions until you feel you have arrived at what is required. A mirror will be an excellent guide to knowing this." Translation from Grayson, 1972: 89.

### *Outline and Luminance Contrast*

Outline and edge detection together form one of the most useful clues to the shape of real and depicted objects. The act of representing objects and figures is, as Baxandall says, largely the act of “backtracking down the channels of perception”.<sup>89</sup> Both in perception and in painting, it is with the outline of forms that an artist begins. In the case of earlier panel paintings, outline was not only the principal means by which forms could be recognised, but also a principal means by which parts of a composition might be visually emphasised. The artist who painted the *Resurrection* panel which forms part of the *Antwerp-Baltimore Quadriptych* (c.1400), for example, delineated the forms of the objects and figures using lines of varying darkness and thickness. As Christ is a key figure, the outline is correspondingly bold, providing visual information about the form of His figure and also serving to make Him stand out strongly from the gilded background (Fig 3.83). Panels with areas of gilding usually have incised outlines around the forms which are painted and often, as on the *Wilton Diptych*, there is also a heavy black outline in paint (Fig 3.84). Whatever the motivation, formal or technical, the function of an outline was simply to define and emphasise form. In parts of the Antwerp-Baltimore panels, however, heavier lines are also used on edges apparently as a shorthand reference to shadow. On the left side of the servant’s orange robe in the *Nativity* panel (Fig 3.85) a thick black line is placed immediately next to the patch of shadow on her apron. Similarly, in the *Saint Christopher* panel a thick black line delineates the darker right edge of the saint (Fig 3.86).

By c.1415, the importance of outline as the principal means of describing form had been replaced in ‘Campin group’ works by a new attention to the description of

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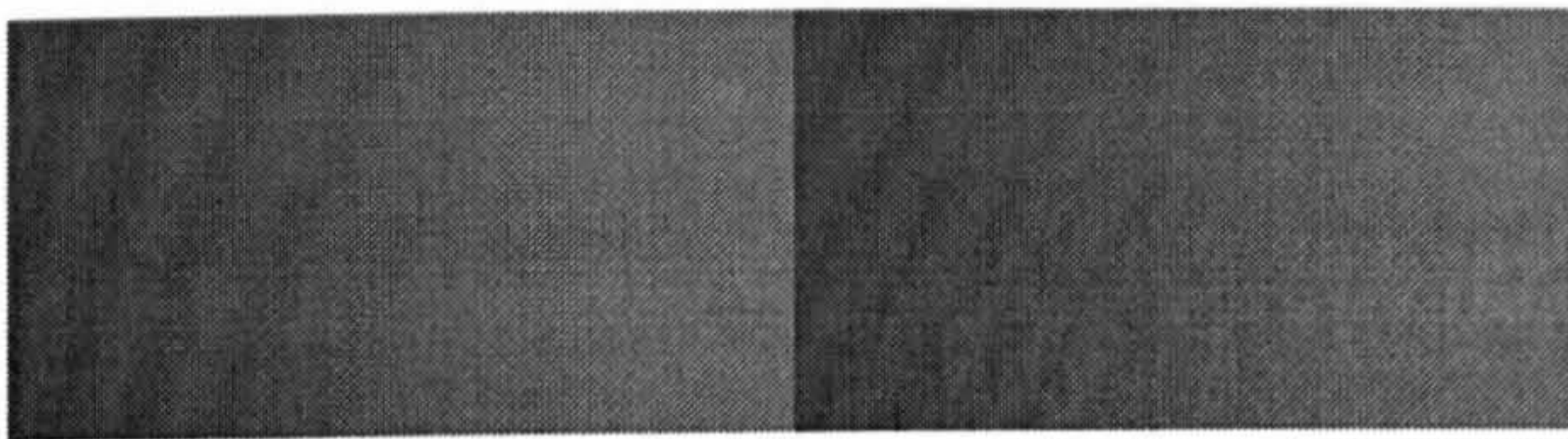
<sup>89</sup> Baxandall, 1995: 130.

shadow. In the *Seilern Triptych* (Figs 3.37 and 3.58-3.60) Campin used the strong black outlines around most of the figures not to describe the form of the figures but rather as a means of emphasising tonal contrast. Quite consistently Campin places the heaviest outlines around the lightest parts of his compositions. Areas of pale flesh are always fully outlined in black, as are white cloths, draperies and headwear in all of his works. (Fig 3.87 shows a detail of a white cloth in the *Mérode Triptych*). Other areas such as coloured drapery and wooden items are usually either very thinly outlined or, more usually, without any form of outline. At a distance from the panels, the black outlines appear to merge with areas of shadow and the dramatic contrast between light and dark serves to heighten the sense of three-dimensionality. At close range, however, the effect appears somewhat clumsy and heavy-handed.

Van Eyck employs an approach to outline that builds on that established by Campin. Like Campin, van Eyck tends to emphasise the edges of lightly toned parts of objects and figures. In contrast to Campin, however, van Eyck is considerably more subtle in the rendering of these edges, usually softening the outermost edge (i.e. the side not touching the light surface). He is also more discriminate in his use of the technique, employing it much less frequently than Campin, and nearly always selecting only light edges that border mid-tones on their shadow side. In the *Rolin Virgin*, for example, black outlines are included on the left side of the Virgin's face (Fig 3.88) and the angel's face (Fig 3.89), the far left side of Christ's right leg, around his right arm (Fig 3.90), and the back of Rolin's neck (Fig 3.91). In a number of places he also places a very thin light line just inside the darker line (the left side of the Virgin's face, for example), increasing the apparent contrast between the surfaces at the edge. A second related technique employed by van Eyck is the darkening of mid-tone areas that border light areas such as hands and faces. In the Rolin panel, for example, the stone directly behind the Chancellor's chin is slightly darker than the

other stones around it (**Fig 3.91**). Perhaps a more explicit use of this latter technique is employed in the *Portrait of an Old Man (Cardinal Niccolò Albergati?)* silverpoint (c.1435/38) (**Fig 3.92**) in which the background bordering the lighter side of the man's face has simply been shaded, not to indicate a cast shadow but to indicate the contrast between the man's face and the darker bordering background.

The reason van Eyck and, to a lesser extent, Campin employed this particular means of emphasising certain edges is probably related to the way we perceive the relative tones of bordering surfaces. Again, our visual system relies heavily on the detection of edges in this process. A modern optical illusion known as the ' Craik-O'Brien illusion' demonstrates the operation of this process better than a verbal description:<sup>90</sup>



Most people when viewing the two graduated rectangles above will perceive the right one to be darker than the left one. Again, this is because our visual system relies heavily on information provided at the edge of shapes, filling in the information about the object from this primary cue. (The receptive field is organised using a 'centre-surround' organisation of cells in the retina). Because the edge of the right rectangle is darker than the edge of the left rectangle, we perceive the *entire* shape to be darker.<sup>91</sup> (The importance of the edge can be confirmed empirically by covering the centre edge and viewing the two shapes again).

The Craik-O'Brien illusion demonstrates that a subtle darkening or lightening of the area around an edge can influence the contrast we perceive between two

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<sup>90</sup> This illusion is explained in Falk, Brill, and Stork, 1986: 189-91.

<sup>91</sup> Adelson, 2000: 339-51.

objects, surfaces or planes. Although it is unlikely that van Eyck was aware of the explanation behind this illusion, he certainly understood how its effect could be employed to heighten the sense of perceived contrast. By enhancing the edges of bright surfaces, van Eyck achieved by optical means a method for suggesting a greater range of brightness than is available physically through dark and light paint alone. The extent to which van Eyck was refining the practice employed by Campin of using black lines around light (usually white) objects is difficult to say. Certainly both artists actively sought to overcome the material limitations of their medium and to instil in their images luminance contrast values that were closer to those perceived in reality than those traditionally indicated in painted descriptions of it. However, whereas Campin's works appear to have a high luminance contrast when viewed from a distance, this effect is undermined at close distance where one is able to see very heavy outlines which do not have an obvious equivalent in reality. In van Eyck's works, the transition between surface edges is rendered sometimes using blended tonal gradients and sometimes using lines of selective thickness. In this respect, 'outline' is only part of a more comprehensive means of describing edges. In each of van Eyck's works, the effect is fully integrated into the description of light as a whole. It is not an independent concern associated with making objects project in three-dimensional relief as it appears in Campin's work. Edges do not function primarily to mark the border of an object in van Eyck, but rather to describe the contrast in luminance between one object surface and another. More than any artist before him, van Eyck was able to picture and describe images in terms of contrasts between values of luminance.

### 3.3.3. 'Mass Painting' versus 'Optical Painting'

As I have already suggested, the sensation of light in van Eyck's paintings relies heavily on the translucent quality of the oil medium. Before looking at van Eyck's 'optical' technique in more detail, it is important to first outline the nature of the 'mass painting' method used by Campin and, to a lesser extent, van der Weyden and its relative limitations.<sup>92</sup>

Although there was certainly a general similarity between Campin and van Eyck in their common desire to replicate effects of luminance, there was a significant difference in the technical means the two artists employed to achieve their goals. Whilst Campin employed somewhat heavy-handed solutions which operated primarily on an optical level when viewed from a distance, van Eyck devised a more subtle and more sophisticated approach which manipulated the translucency of the oil medium to enhance and generate optical effects by manipulating the interaction of the paint layers with real light.

Technical evidence itself provides a broadly satisfactory explanation for the difference in 'style' between Campin/van der Weyden and the approach of van Eyck. First, the ground or an isolating layer plays a different optical role. Whilst van Eyck used a reflective white or pale underlayer which influenced the subsequent modelling of forms in their lighter tones, painters of the Campin/van der Weyden groups tended to employ a lightly coloured ground which influenced the general hue of the subsequent layers.<sup>93</sup> Rogier van der Weyden, for example, made use of coloured isolating layers in at least six of his panels. Rather than using a reflective white layer,

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<sup>92</sup> These terms were used by De Vos, 1999 to characterise the differences between the artists' techniques. He points out in particular the difference in the density of white employed by Campin/van der Weyden compared with van Eyck. He argues that van der Weyden gradually shifted toward a more optical style which combined the two approaches.

<sup>93</sup> See, for example, van Asperen de Boer, van Schoute, Garrido and Cabrera, 1983: 39-50 and Bomford, Campbell, Roy and White 1996: 47.

he appears instead to have favoured either a light grey or pink priming. The aesthetic function of this coloured layer was presumably to unify the overall hue of the paler tones as opposed to providing a reflective base. The colouring function of this layer allies it more closely with the purpose of the Italian 'imprimatura'.

Of greater significance than the under-layer is the fact that Campin and Rogier tended to use a higher proportion of white uniformly throughout their compositions. Whereas a significant proportion of light tones in van Eyck's panels are produced using a thin, usually translucent, application of paint, comparable areas in the work of Campin and Rogier rely more heavily (though not exclusively) on thicker applications of paint admixed (opaquely) with lead white. As the above analysis has noted, this difference in technique is discernible with the naked eye. Paintings that contain a high proportion of lead white in their paint mixtures have a greater plasticity and colours are increasingly desaturated as they become lighter, often appearing quite 'milky'. This difference in the use of lead white has also been demonstrated in several technical studies with the aid of X-radiographs. As lead is very absorptive of X-rays, lead-containing pigments such as lead white appear light on X-ray film. These studies have shown that the overall density of lead white used in works attributed to Campin and Rogier is significantly higher compared with the density used by van Eyck. A comparison of X-radiograph images of van Eyck's *Lucca Virgin* and Campin's *Virgin and Child* shows a clear difference in technique (Fig 3.93).<sup>94</sup> The van Eyck image appears dark and indistinct whereas the Campin image shows clearly discernible forms, articulated by the absorptive lead-containing white which appears light on the image. In comparison with Campin, van der Weyden relied less heavily on the use of lead white for modelling. However, comparison between Rogier's *Portrait of a Lady* and van Eyck's portrait of *Maragret van Eyck* (Fig 3.94) demonstrates that Rogier

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<sup>94</sup> The comparison is made by Dijkstra, 2005: 322 and 324-25.

still relied on lead white for the modelling of highlights, compared with van Eyck who relied primarily on a thinner or more transparent application of paint.<sup>95</sup>

As well as relying more heavily on lead white to produce highlight tones, Campin and to a lesser extent Rogier also tended to use more lead white in the lighter mid-tones. For the drapery of the Virgin on the *Virgin and Child Before a Firescreen* (c.1440) (Fig 3.95), for example, the artist produces mid-tones using ultramarine and red lake admixed with lead white.<sup>96</sup> To produce the lighter tones of the folds, the artist simply mixes increasingly more lead white into the basic hue (thus making the lighter areas thicker). Likewise, Rogier relied heavily on the admixture of white in the upper layers to produce light tones. For the drapery of St. Luke on the Boston *Saint Luke Drawing the Virgin* (c.1435-36) (Fig 3.96), for example, Rogier modelled the folds with two mid-tone opaque layers of vermilion mixed with white, over which he applied a red lake glaze. To create the highlights, he added 'relatively thick opaque pink paint' (composed of lead white, calcium carbonate and red lake).<sup>97</sup> In comparison, the folds of the Virgin's robe in van Eyck's *Washington Annunciation* (c.1434-36) (Fig 3.97) were modelled in two underlayers of blue admixed with white, over which a pure glaze of ultramarine (probably in a glue medium) was added. Consequently, lighter tones are not reliant on the admixture of white in the surface layer, but on the use of white in the layers beneath the blue glaze.<sup>98</sup>

It is interesting to note that Rogier van der Weyden's approach to modelling shadow has much in common with the (typically Italian) aesthetic of tempera painting. To model drapery, Rogier used a base layer consisting of a mid-tone over

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<sup>95</sup> This comparison is made by De Vos, 1999: 146.

<sup>96</sup> Campbell, Bomford, Roy and White, 1994: 30-33.

<sup>97</sup> Newman, 1997: 139-40, and MacBeth and Spronk, 1997: 122.

<sup>98</sup> Gifford, 1999: 108. The blue glaze was replaced by David Bull in the conservation treatment completed in 1994.



which highlights were added using a mixture of the same pigment with an admixture of lead white. Shadows were added using glazes of the same pigment.<sup>99</sup> For the Magdalene's green dress on *The Magdalen Reading* (c.1435) (Fig 3.98), a mid-tone of green (verdigris, lead-tin yellow and lead white) provides a base layer for the modelling of light and shade in the subsequent layers, produced either with the admixture of more white or more green (verdigris and lead tin yellow).<sup>100</sup> In each case, Rogier (or an artist from his workshop) models from a mid-tone, not from dark to light or light to dark. In this respect, his technique is different from both van Eyck and from many tempera painters. However, the final tonal contrast and the relationship between the brightness and saturation of colours is much the same as one finds in tempera panels – common to both is the process of producing highlights with the admixture of white and shadows with thicker layers of the dominant ('local') hue. The technique employed by van der Weyden produces only limited contrast between the darkest and the lightest tones and, in particular, many shadows appear unnaturally light in comparison with the darker tonality of some real shadows. Tempera artists had tended to avoid adding black to shadows to darken them because this gave them an undesirable 'muddy' appearance.<sup>101</sup> Van Eyck's method, as the following section will demonstrate, allowed him to darken his shadows both in the under-layers and in the top layers, preventing the loss of so much saturation in the colour. The practice of darkening shadow areas of red using glazes of ultramarine has been identified in several panels by van Eyck and appears to have been a distinct feature of Eyckian practice.<sup>102</sup> (This method was later employed by Petrus Christus).

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<sup>99</sup> Campbell, Foister and Roy, 1997: 74, 76.

<sup>100</sup> Campbell, Foister and Roy, 1997: 76.

<sup>101</sup> The process described by Cennini in *Il Libro dell'Arte* uses no black at all.

<sup>102</sup> According to Campbell, 1997: 38, the practice of incorporating ultramarine in shadow areas was more common in the circle of van Eyck and Petrus Christus. Ultramarine has been identified in shadow areas on the *Arnolfini Double Portrait* and *Man in a Red Chaperon (Self-Portrait?)* and also the *Portrait of Marco Barbarigo* by a follower of van Eyck.

A further congruence between the tempera technique and the Rogierian technique is that the shadow areas are also always the most saturated parts of the image. Again, this does not correspond well with the behaviour of perceived colour in real life where the most pure, saturated colour appears at a point between the mid-tone and the highlight. Van Eyck's paintings, however, correspond much more closely with reality. By using superimposed translucent layers, mostly of the same hue, saturation is at its strongest in the lighter mid-tones where the least modulation of tone occurs. The saturation is therefore at its strongest at the correct point in the tonal scale, according with how we perceive modulated colour in real life.<sup>103</sup>

#### **3.3.4. Optical Painting and Selective Translucency: The Eyckian Method**

Van Eyck's paintings use the transparent quality of glazed oil paint to suggest an equivalence to values of luminance and a congruence with the optical experience of light-generated images.

It is important to recognise, first of all, that the relationship between colour and transparency in van Eyck's works was heavily dictated by which pigments were suitable for producing true glazes in oil. Whilst any pigment can be mixed opaquely with white, a technique that employs transparency as a means of producing varied tones of the same hue is more restricted in the choice, handling and placement of pigments. Glazes were always bound in oil, sometimes with some resin additive.<sup>104</sup> The only exception was ultramarine blue, which appears to have been bound in glue as a glaze. Though less transparent than when bound in oil, ultramarine bound in glue still produces a translucent glaze. Pigments with a refractive index near to that of oil

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<sup>103</sup> This point is made by Dunkerton, Foister, Gordon and Penny, 1991: 194.

<sup>104</sup> For opaque paints, van Eyck likewise used a drying oil. Some samples from the *Ghent Altarpiece* have indicated the use of a protein additive also. Kockaert and Verrier, 1978/79: 122-26.

(1.48) produce the most transparent glazes when bound in oil. Of the colours known to have been used by van Eyck,<sup>105</sup> red lake (RI = 1.66), ultramarine (RI = 1.50), azurite (RI = 1.73-1.76) and verdigris (RI = 1.53-1.56) are all highly suitable for producing glazes in oil (or glue in the case of ultramarine). Lead-tin yellow type II (RI = above 2.00), also used (sparingly) by van Eyck, is opaque as are the earth colours that have been identified in van Eyck's palette – red iron oxide (RI = 2.78-3.01) and yellow Terra di Siena (RI = 1.87-2.17). The pigments van Eyck applies most consistently as glazes (mostly on objects in the foreground) are therefore the ones most suitable for this purpose – ultramarine, azurite, red lake and verdigris. In this respect, van Eyck followed an established tradition in which these same pigments were used as glazes in the rendering of drapery.<sup>106</sup>

Like earlier painters, van Eyck also employed a system of glazed layers in the rendering of drapery. For the Virgin's blue robe and mantle on the exterior of the *Ghent Altarpiece* (Fig 3.99) and on the *Washington Annunciation* (Fig 3.100 and 3.97), van Eyck appears to have used broadly the same process. In both examples, a layer of blue (azurite in the Ghent panel, ultramarine in the Washington panel) is set down over a bright 'isolating layer' of lead white indicating the modelling of shadow in the folds. This is followed by a second blue layer, which softens the contrast of the tones in the first layer. Over this is added a rich translucent glaze of pure ultramarine (probably bound in glue in both examples).<sup>107</sup> As the layers are built up from bottom to top, progressively less lead white is used as an admixture, imparting a deep

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<sup>105</sup> Values for refractive indexes are all taken from the relevant entries on the CAMEO database (Conservation and Art Materials Encyclopaedia online) <http://cameo.mfa.org/index> (accessed 20/04/06).

<sup>106</sup> Plahter, 2003: 161 and 166 notes that the Norwegian frontals tend to use translucent glazes over white or silver in areas of drapery and more opaque colours for architectural elements. This study also notes that only red lake, copper green and raw sienna draperies are treated using transparent glazes. Other pigments (which do not produce true glazes) are handled opaquely, wet-in-wet.

<sup>107</sup> Gifford, 1999: 108. In certain highlights on the Ghent panel, there is evidence of an additional layer between the azurite and the ultramarine glaze consisting of lead white and ultramarine. For this, see Brinkman, Kockaert, Maes, Thielen and Wouters, 1988: 27-29.

saturation to the hue and allowing the lower modelling layers to be seen through the translucent top layer. A certain amount of the lead white isolating layer beneath the coloured paint layers also reflects transmitted light from the blue part of the spectrum through the upper layers. In those parts of the painting where this structure is employed, the artist has used the best available means to maximise the saturation of colour and the physiological effect of luminosity. These areas also respond most strongly to real reflected light from the viewer's space.

Van Eyck's use of glazes was, however, far more complex than simply a system for constructing brightly-coloured drapery. The red, blue and green pigments need not have been applied as glazes at all but could instead have been admixed with lead white in the way Campin had used them. There is, however, a kind of logic in van Eyck's work which is not only concerned with the lustrous, material quality of coloured glazes but also with how translucent paint can suggest qualities of pictorial luminance. With only two exceptions, van Eyck uses a substantially higher proportion of apparently 'monochromatic' colours in the foregrounds of his panels than is used in the backgrounds. In each case, apparently unmixed pigments of red, blue and green dominate the area comprising figures and objects in the foreground whilst the backgrounds are dominated by brown-greys and olive-greys, primarily produced by mixtures of (primarily opaque) earth colours with varying admixtures of black and white. In the Washington *Annunciation* (Fig 3.100), for example, the principal foreground components, the Virgin Mary, Gabriel and the stool cushion are rendered in glazes of bright red and blue. The blue is constructed entirely from ultramarine, although in other paintings van Eyck also uses azurite glazed with ultramarine.<sup>108</sup> The

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<sup>108</sup> For the blue of the Virgin's robe, see: Gifford, 1995b: 86. The Virgin's robe on the *Ghent Altarpiece* is made up using the same layer structure except the underlayer is azurite, not ultramarine. Coremans, 1953: 70-71.

red is also in reality constructed from two pigments (vermilion and red lake).<sup>109</sup> Even where two pigments are used, however, the hue is close enough that they appear to be unmixed or 'monochromatic'. Although some of these colours are in reality mixtures of different pigments of similar hues, they appear to correspond with a spectral palette (by which I mean colours composed of a single wavelength that make up white light). The fact that Gabriel's wing displays the entire range of spectral 'colours' (wavelengths corresponding with violet, blue, cyan, green, yellow, orange, red) in the correct sequence perhaps suggests that van Eyck was consciously referring to the idea of not just a monochromatic palette but a spectral (or 'rainbow') palette.<sup>110</sup>

In the background, a non-spectral mixed tan colour is used for the architecture. In contrast to the foreground objects and figures, the colour is not only a non-spectral colour, it is also desaturated by the quantity of admixed white and black. Along the floor, most evidently, the saturated, purer ochre-tan pigment of the area in front of the figures not only becomes darker in tone, but also desaturates as it extends behind the figures to a tone and hue similar to the rest of the surrounding architecture. Only in the windows at the back of the church does saturated, spectral colour return in response to the second visible light source coming through the glass from outside.

In the Washington panel, the construction of Gabriel's cope (Fig 3.101) follows the process outlined above – a preliminary layer of vermilion prepares a base colour over which several glazes of a more transparent red lake are 'superimposed' to suggest the varying depth of the velvet pile.<sup>111</sup> This particular method of rendering drapery has consistently been found in van Eyck's other panels.<sup>112</sup> A similar effect is used in the *Virgin and Child with the Canon van der Paele* (Fig 1.4) where the

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<sup>109</sup> Gifford, 1999: 108-09.

<sup>110</sup> De Mey, 2001: 96-97.

<sup>111</sup> Gifford, 1999: 108-09.

<sup>112</sup> See Brinkman, Kockaert, Maes, Thielen and Wouters, 1988-89: 36.

principal figures (St. Donatian, the Virgin and Canon van der Paele) are each given garments rendered with the same glazed layer structure outlined above. I would suggest, however, that this was not simply a system for constructing drapery but also a sophisticated way of denoting objects or figures that respond most strongly to intense illumination. As objects in the foreground nearly always fall in the path of the primary light source, a high proportion of these are rendered in spectral colours, using a translucent glazing technique. In the van der Paele panel, for example, the primary light source comes from the upper left of the frame, glancing the side of Donatian's cope producing a substantial amount of self-shadow on the left side of his face and the lower part of his garment, illuminating the front of the Virgin's garment and falling most fully on the front of the patron, almost like a theatrical spotlight. The light through the windows on the back wall is much less intense than that originating outside the frame of the picture. The white of van der Paele's vestments obviously reflects most fully the real light from the viewer's space, but the luminance of the red worn by the Virgin and the blue worn by Donatian is given a similar intensity. It is not just the garments that are rendered with the use of the reflective white isolating layer, however. The flesh tones are also painted thinly in two layers (paint used in the flesh areas of van Eyck's panels is typically thinner than any of the other paint sections),<sup>113</sup> making use of the reflective lead white underlayers beneath.<sup>114</sup> In contrast, the architecture, which is dimly lit, is painted more opaquely using earth pigments admixed with white and black to suggest areas of light and shade. There is therefore a visual contrast not just between the mostly transmitted light of the foreground colour and the more absorbing light of the architecture but also between the perceivable

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<sup>113</sup> Coremans, 1953: 74.

<sup>114</sup> This point is demonstrated by Kockaert and Verrier, 1978-79: 125, and also van Asperen de Boer, Ridderbos and Zeldenrust, 1991: 12.

solidity of the paint mass applied to the architecture and the relative intangibility of the foreground forms. Likewise, in the Washington *Annunciation*, the walls are painted with a single layer of opaque tan-coloured paint modulated using charcoal black and lead white to create modelling. For the rear wall, apparently in deeper shadow than the side wall, a more solid layer of the same mixture has been used. Whilst it is certainly true that van Eyck manipulates the glazes to suggest real textures such as velvet, the reliance on the nature and level of real illumination acting on the panel also instils even the most apparently tactile surface with the dual sensation that it is only perceivable and perhaps only materialised by virtue of the light from our space. In the area immediately behind the figures, the suggestion of a constant internal light source makes the more solidly and opaquely conceived space seem entirely appropriate.

Both the van der Paele panel and the Washington *Annunciation* employ similar lighting in which the foreground figures are lit by a bright source of light outside the pictorial space. Behind the figures, however, an internal light source punctuates the dark interior space using the same technique used to render the foreground objects and figures. Turning again to the Washington panel, the ‘bull’s eye’ windows directly facing the viewer appear (in contrast to the generally dark space) to emit light, in much the same way a real window might. Again, this effect relies on the contrast between the darker absorbent rendering of the masonry and the fact that real light is reflected from the white paint layer representing daylight through the glass. Over this layer, thinly applied translucent red, green and yellow pigments are activated by transmitted light from the white surface below. (This recalls the glazed paint over burnished silver foil used on the windows in the *Châteauroux Breviary* shown in Figs 3.52 and 3.53). The physiological effect relies on the similarity between glazed or very thin layers of translucent paint and coloured glass – both are seen by transmitted

rays of light. In the case of actual coloured glass, the light is direct rather than reflected, but the visual sensation is virtually the same.

This effect is not found at all in works associated with Campin or his workshop. In the *Mérode Triptych* (Fig 3.39), for example, the artist employs a similar approach to van Eyck, employing saturated, spectral colours in the foreground space and a desaturated pale grey in the background. In addition to the relative uniformity of illumination inside the depicted space, there is also uniformity in the apparent solidity of forms – objects simply adopt the solidity of paint mass. As the artist used a substantial proportion of white on the drapery and flesh tones of the figures, they have a similar appearance of solidity to the architecture. Furthermore, some of the desaturated hues in these areas match both the tonality and also the hue of the background space very closely, which strengthens the perceived continuity between the nature of light from background to foreground. The ‘Campin group’ *Virgin and Child before a Firescreen* (Fig 3.102) avoids this latter visual association between foreground and background by using much less white in the background, but the solidity of all forms is uniform throughout the space.

Works attributed to Campin and his workshop use translucent glazes in a less sophisticated manner than is evident in van Eyck’s method. If one compares van Eyck’s use of transparent layers and the way in which they relate to areas of depicted light to a panel such as the *Virgin and Child before a Firescreen* the difference is immediately apparent. The painting describes a strong light source to the upper left of the panel which produces cast shadows from the Virgin’s arm onto the table beside her, from Christ’s arm onto the Virgin’s arm, from the silky red cushion onto the green cloth and from the book clasp onto the pages of the book. Although shadow is used to create modelling this is not its only function (as one finds in the Antwerp-Baltimore panels, for example). Like van Eyck, this artist suggests a strong light



source to the side of the panel (presumably daylight through a window) which also functions as a subtle means of relating objects spatially through light and shadow and also as a means of drawing attention to particular objects. (There is also an obvious interest in specifying different textures which to an extent also derives from a sensitivity to forms of microshadow). As in the two van Eyck panels cited above, the intensely lit figures are positioned in the foreground with a window facing the viewer on the back wall through which the daylight contrasts the relatively dark interior space with the daylight outside. The way in which the paint is employed to correspond with the effects of the primary light source does not, however, relate to the use of translucent glazed passages of paint. In fact, the use of glazing in this panel is restricted to the pink cushion which has a surface glazed layer of red lake and the green cloth which is glazed with a copper green. With the exception of these two small areas, the gradations of tone responding to light and shade are produced using opaque wet-in-wet paint with varying amounts of lead white. In the lightest areas of the Virgin's drapery, for example, the thickest paint passages are found in the lightest parts of the depicted folds, progressing from dark to light in layer structure. (This dark to light technique is also found on other 'Campin group' panels such as the *Seilern Triptych*).

Van Eyck's portraits are fairly systematic in their composition and lighting and are therefore particularly instructive in demonstrating his approach to lighting and contrasts of luminance. In each case, the subject is in three-quarter view, facing directly toward the light source (a window) to the left which generates attached shadow (or 'self-shadow') on the left (our right) side of the head. Specular highlights in the eyes vary slightly in their position, but they consistently locate the light source at around 45° to the left of the picture plane. In those, such as the *Man with a Ring* (Fig 3.35), where the subject gazes straight ahead, the specular highlight appears in

the centre of the pupil. In those such as *Jan de Leeuw* (Fig 3.36) where the subject turns to face the viewer, the highlight is positioned to the left of the pupil. In all of these portraits, the background is a solid dark colour of black or near black. As I suggested in section 3.3.1, van Eyck was probably not the first artist to employ a dark flat background in a self-contained portrait, but he was apparently the first artist to have realised how such a background might be made to suggest a particular condition of lighting.

The use of the black or dark background serves much the same purpose as the relatively dark interior spaces in the religious panels. In fact, the effect is all the more striking as the discontinuity between foreground and background illumination is greater. Whilst the dark setting reflects relatively little light from the viewer's space, the glazed and thinly painted forms of skin tones and bright headgear and clothing are activated by real light which corresponds with the suggestion of a pictorial light source with its origin in our space. The effect is much like a dramatic spotlight on a dark stage. For the *Man with a Ring* (Fig 3.35), for example, flesh was painted thinly (c.24 microns) in just two layers, allowing the reflection of light from the ground.<sup>115</sup> The chaperon was painted with lapis lazuli and (varying) small amounts of lead white (c.54 microns) over a pale pink layer (c.30 microns), which influences the final tonality of the blue.<sup>116</sup> Significantly, whilst it would have been easier to work from a dark ground, from dark to light, using a significant proportion of white to model highlights, van Eyck instead paints the dark background around reflective (glazed or thinly applied) passages of paint that form the subject. The contrast between the more reflective areas of the head and clothing and the more absorptive area of the background serves to suggest an illusion that real light alone, not a mass of applied paint, makes the man visible to us. Because the backgrounds are so dark in Eyckian

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<sup>115</sup> van Asperen de Boer, Ridderbos & Zeldenrust, 1991: 12.

portraits, the implication is that there is no internal source of illumination – subjects are apparently and actually lit from a light source in the viewer’s space.

Van Eyck’s technique allowed him to produce brighter colours than the alternative opaque method used by his contemporaries. In shadow areas, glazes allow shadows to be both dark and also saturated. In mid-tones and light tones, glazes and paint applied thinly over a pale or white underlayer produces brighter colours than pigment which is desaturated with white. The sensation of viewing these parts of the painted image is similar to looking at coloured light. In highlight areas, the limitation of the brightness of opaque white is overcome through optical means by darkening bordering surfaces to make the contrast appear greater. Everything about van Eyck’s approach seeks a greater sense of luminosity. The most effective aspect of van Eyck’s method, however, is how the sensation of luminosity is controlled. By employing a combination of translucent paint with under-layers which vary in reflectivity as well as hue and tone, van Eyck was able to control not simply how light or dark surfaces in the painting appear but also how luminous they appear in relation to an implied pictorial light source.

### **3.4. Luminance and Spectral Images**

The properties of van Eyck’s paintings as described above have much in common with the characteristics of images produced by convex glass mirrors. Most obviously, spectral images have a brightness and a high luminance contrast that van Eyck’s paintings aspire to reproduce. Like van Eyck’s paintings, they render surfaces according to differing levels of luminance. In the brightest parts of the image, the sensation that lighter tones are produced by a more intense reflection of light is much

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<sup>116</sup> van Asperen de Boer, Ridderbos & Zeldenrust, 1991: 10.

the same as the sensation of looking at the most luminous, glazed passages of van Eyck's paintings.

By far the most important property of convex mirror images, however, is that mirrors change the status of perceived objects from tangible, three-dimensional 'things' into two-dimensional representations of those things. As mirror images are generated by light alone, objects viewed in the mirror are much more easily read as shapes with differing values of colour and luminosity. Everything viewed in a convex mirror loses its mass and solidity and becomes intangible, appearing simply like coloured light on a smooth surface.

Viewing a scene in a convex mirror changes significantly not just what is seen but also the process of how things are seen. By translating objects into reflected equivalents, properties of light and shade can no longer be seen as attributes of the objects. Instead, the perception of light and shade acquires a more important role in the perceptual process whereby objects become attributes of light. It is in this respect that I believe the relationship between van Eyck's paintings and the properties of mirror images come closest. I would also argue that this analogy is not coincidental but carefully engineered.

### **3.5. Conclusion**

In practice, van Eyck's style and technique are of course infinitely more complex than I have been able to indicate in this chapter. The practice of painting itself comprises a continuous stream of decisions, some of which might be preconceived, others more spontaneous. What I hope to have indicated is the nature of the rationale that informed many of the technical and stylistic decisions van Eyck made. On the one hand, van Eyck was continuing an oil painting tradition in which the imitation of luminous jewel-like transparency was highly valued. On the other

hand, the way in which he perceived specific, often subtle conditions of illumination was entirely unprecedented. What van Eyck succeeded in doing is integrating these two concerns by discovering and demonstrating that layers of translucent colour were not simply substitutes for precious materials but rather the foundation for articulating a particular view of reality. This reality was not based on the construction of objects through physical masses of paint but on an acute sensitivity to the ways in which our perceptual system processes particular effects of light as it activates the colour, tone, texture and luminance of all surfaces including his own paintings. What translucent paint allowed van Eyck to do was to suggest that the perception of luminance, not mass, outline or geometry was the most important aspect of producing and reading images.

## **CHAPTER IV**

### **SCALE AND DETAIL IN VAN EYCK'S PAINTINGS**

## 4.1. Introduction

The distinctive character of van Eyck's paintings is frequently associated in the literature with their apparently meticulous descriptions of detail. Compared with the expressive and decorative character of van der Weyden's work and the solid character of Campin's, Eyckian paintings tend to be characterised not only as luminous but also "microscopic". With relatively recent developments in the application of macro-photography, however, scholars such as Lorne Campbell have demonstrated that, at least in certain passages, van der Weyden's paintings are at least as detailed as any by van Eyck. There is therefore a significant divergence of opinion in modern scholarship about just how detailed van Eyck's paintings really are.

Using analyses of high quality images, some 1:1 scale, others taken from images magnified larger than actual size,<sup>1</sup> this study will assess the nature of detail in van Eyck's paintings compared with the approach of his contemporaries. (Where images are reproduced larger than 1:1, the factor of enlargement is given in the form  $y \times M$  in the figure captions). Particular emphasis is placed on comparisons between van Eyck's paintings and those by Rogier van der Weyden in an attempt to examine the assertion made by Lorne Campbell, which I believe is misleading, that Rogier's paintings are more finely articulated than Jan's. This chapter describes how van Eyck's paintings alter the expected relationships between scale, detail, image resolution and viewing distance to produce images which often appear infinitely detailed. It also considers how these factors relate to the 'syntax' of mark-making in large-scale and small-scale paintings. Whilst description in larger works like the *Ghent Altarpiece* responds to the physical limits of viewing in a specific setting, smaller works like the Philadelphia version of *Saint Francis Receiving the Stigmata*

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<sup>1</sup> To retain image resolution, all images in this chapter have either been taken from actual size images or have been scaled down from images of the paintings which are larger than actual size. No images have been scaled up.

(1430s) literally describe more than the viewer is able to see with the naked eye. The chapter argues that, at both extremes of scale, van Eyck's works consistently demonstrate the same fascination with the limits of what can be described and what can be seen.

#### **4.2. The Relationship Between Detail and Scale**

Before looking at van Eyck's works, it is necessary to outline more fully the relationship between detail and scale. It is important to recognise, to begin with, that large paintings are able to convey proportionally more visual information about surfaces and their textures than small paintings. A life-size painting of a person's head, for example, might describe wrinkles in the subject's skin, fine hairs or stubble and blemishes or spots. On a painting one quarter of the size, these same details would be too small for a painter to articulate finely enough in paint. One might say, therefore, that the larger painting includes more visual information about the subject than the smaller painting. This does not however translate to the larger painting being more 'detailed' than the smaller one. I should like to look briefly at why this is the case.

Although it is more difficult to include fine details in small paintings, their scale naturally invites a much closer inspection from the viewer. Any fine details in these paintings are therefore likely to be easily perceived, along with the brush-marks that describe them. In contrast, large images invite inspection primarily from a distance but also from close-up. From a distance, the finest details may not be visible and brush-marks are also less likely to be perceivable. If the viewer looks at the same large painting from close-by, the perception of fine marks would be the same as that described for the small painting. However, marks of the same size on a larger scale can be made to describe details that are proportionally much finer on a small scale. Likewise, the finest marks on a large scale can describe details that would be too fine



to include on a small painting. Despite this advantage, it is not always the case that the larger painting will appear more detailed than the smaller one.

Painted detail is primarily an issue of how description relates to perceived detail in real visual experience and how far it either meets, fails to meet or surpasses the expectations of a viewer. Whilst a larger scale allows a painter to describe more detail, if this scale is near life-size for example, the viewer will naturally expect that the description of surfaces and textures would be approximately the same as one experiences in real life. If the scale is larger than life-size, the viewer is likely to expect that this description should be proportionally greater than what one experiences in reality. Conversely, if the scale is smaller than life-size, the viewer is likely to expect that description of surfaces and textures would be proportionally less fully articulated. Generally speaking, if a painting fails to meet such expectations, the image will appear to lack detail. If a painting surpasses these basic expectations, as most of van Eyck's paintings do, the level of descriptive detail can appear almost hyper-real.

As the expected level of description is lower for forms of a smaller scale, an impression of detail can be conveyed in small scale images using fewer descriptive details than is required for large scale images. Both the artist and the viewers are conditioned by real experience to seeing objects, and in particular the textures of their surfaces, at a certain level of detail. Again, proximity to the subject plays a significant role in forming such expectations from experience. The details of more distant, smaller objects are more difficult for the eye to resolve and so a loss of detail is encountered by objects that are farther away. Also, in many cases, description on a small scale is limited by what the viewer is able to see with the naked eye. It is only necessary to provide description to a point which is resolvable by a viewer at the expected viewpoint. The tendency for viewers to look more closely at smaller images

also places a different emphasis on the role of brush-marks in small paintings. Whilst the smaller scale requires proportionally finer marks, the closer viewpoint also means that these marks are more easily perceived according to the language of their description (the marks themselves) as opposed to what they represent pictorially.

The following analysis therefore considers detail in two distinct ways – as a measure of how far painted description meets the expectation of the viewer (which I will refer to as the image ‘resolution’) and as a measure of how finely this description is rendered according to its application (which I will refer to as ‘fineness’). A distinctive feature of van Eyck’s paintings is their ability to suggest that they describe more detail, especially in the description of surface textures, than the viewer expects to see, based on a comparison with detail and scale in real visual experience. In this respect, they have a particularly high resolution in terms of what they seek to represent. A further characteristic of Eyckian paintings is that brush-marks are almost always either imperceptible or read as description as opposed to marks in paint. In this respect, they are particularly fine in their rendering of detail. These related characteristics apply to both large and small scale works in differing proportions, with larger works being more concerned with image resolution and the appearance of detail and the smaller works being more concerned with the fineness of the execution. Whilst van der Weyden’s paintings often include passages of very fine description, they are less concerned with how these details are perceived in specific viewing conditions.

#### **4.3. Scale, Style and Detail in van Eyck’s Paintings**

Although no study has been made of van Eyck’s approach to detail, developments in the field of technical studies, as well as significant improvements in the quality of colour print reproduction, have led to useful but limited analyses of

detail in works by van der Weyden, Campin and van Eyck.<sup>2</sup> Although information from these studies will be referred to throughout the chapter, I should like to make specific mention of Lorne Campbell's technical study of van der Weyden's paintings in which he compares details of several paintings in London from the van der Weyden Group with details from van Eyck's *Arnolfini Double Portrait*.<sup>3</sup> In this, Campbell uses analyses of micrograph images to demonstrate that several passages of Rogier's paintings are more finely painted than similar passages in van Eyck's Arnolfini painting. He shows that the beads in Rogier's painting of *The Magdalen Reading* (before 1438) (Fig 4.1) were painted more carefully and less quickly than the amber beads in van Eyck's portrait (Fig 4.2), which he argues were painted at great speed. He remarks on the fineness of details in Mary Magdalen's book (Fig 4.3), such as the red ruling lines and the presence of a fully articulated fleur-de-lys, measuring 1mm, painted on the 3mm boot of the crossbowman in the background (Fig 4.4). Campbell contrasts these examples of careful painting with selected passages from van Eyck's painting which he argues are suggestive of the spontaneity of van Eyck's practice. He shows images of the brush (Fig 4.5) which is painted using a sgraffito technique (using the handle of the paintbrush) and parts of the painting where the artist used his fingers to blend paint (the shadow cast by the dog and Mrs Arnolfini's dress) (Fig 4.6).

Generally, Campbell's argument is useful and I would not disagree entirely with the analysis of the examples he cites. He does, however, overplay the idea of van Eyck being a spontaneous artist. Certainly highlights on the beads were painted relatively quickly, but the use of fingers for blending is as much a practical and

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<sup>2</sup> Most notably Butler, 1997, which is discussed later in this chapter. Dunkerton & Billinge, 2005 include short but useful analyses alongside micrograph images, but the *Arnolfini Double Portrait* is the only featured painting by van Eyck.

<sup>3</sup> Campbell, Foister and Roy 1997 and also Campbell, 1995: 7.

effective way of manipulating paint as a sign of spontaneity, and likewise, the use of the brush handle is the most effective means of achieving a sense of the sharpness of broom bristles. Rather than reading these examples as signs of quick painting, it is equally important to read them as indications of an inventive artist in command of his materials. Campbell's arguments also lack the context of examples, from the Arnolfini painting and other paintings by van Eyck, in which the execution is very fine and very carefully articulated, such as the background landscape in the Turin *Saint Francis Receiving the Stigmata* (1430s) (Fig 4.7), the painting of the eyes in the *Portrait of a Man with a Red Chaperon* (1433) (Fig 4.8) and the fur trim on Mrs Arnolfini's dress (Fig 4.9). Most importantly, partly because his discussion lacks the context of a broader range of paintings, Campbell's discussion makes no allowance for how detail operates in relation to image scale and only limited allowance for how and why the approach to detailed description varies in the work of both artists (most widely in van der Weyden's work in fact). The analysis provided in this chapter seeks to clarify the points raised by Campbell's comparison.

The second study of significance to this inquiry is Charles Sterling's pioneering article of 1976, which contains what is still the only significant discussion of the relationship between scale and style in van Eyck's practice.<sup>4</sup> In this, he plausibly suggests that the concerns of a large-scale polyptych such as the *Ghent Altarpiece* encouraged van Eyck to employ a style appropriate to maximising the clarity of images designed to be seen in dark, candlelit churches from a distance. Figures in the larger paintings, he argues, tend to be proportionally larger, with clear (often awkward) gestures and a harder, more sculptural rendering of form. Smaller images, such as the *Virgin in a Church* (c.1426-28) (Fig 1.11), he argues, were painted for domestic rooms and private chapels and were used more like illuminations

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<sup>4</sup> Sterling, 1976: 7-59.

in Books of Hours. Consequently, the style of these works is appropriate for the more intimate experience of viewing them: figures are proportionally smaller and more gracious, the light is more diffuse and the rendering is finer, more subtle and more atmospheric. He adds that medium-scale panels such as the *Rolin Virgin* (Fig 2.10), the *Lucca Madonna* (Fig 1.1) and the *Arnolfini Double Portrait* (Fig 1.3) fall somewhere between these two concerns with strong modelling but also some subtle nuances of texture and light. His discussion of van Eyck's treatment of detail is brief and follows the basic idea that smaller works are painted more finely and with greater nuance than the larger works.

Certainly, the larger-scale works seem careful to include figures whose gestures are readable from a distance (St. George on the *Van der Paele Virgin*, for example (Fig 1.4)). Also, it is true that figures such as those in the Washington *Annunciation* (Fig 3.100) are modelled using very strong contrasts of light and shadow (as I discussed in Chapter III). Sterling's distinction, however, is somewhat simplistic: relatively large, strongly lit figures, often with a somewhat heavy or frozen appearance, feature in both small and large works by van Eyck, as do the ambiguous discrepancies of scale. Likewise, full height grisaille figures feature on smaller panels such as the *Dresden Triptych* and the *Thyssen-Bornemisza Annunciation* (Fig 3.77). The most significant failing of Sterling's discussion, however, is the assumption that the larger panels were necessarily meant to be seen at distance (or indeed in the dark). In fact, we know that the physical placement of van Eyck's two largest works, the *Ghent Altarpiece* and the *Van der Paele Virgin*, would have precluded them from being seen at all from a distance of anything more than a few metres. Both panels were made not for the high altar but for small, partially enclosed side chapels in which light from nearby windows would have provided ample illumination during daylight

hours. (The Vijd chapel was separated by a wrought-iron grille from the ambulatory as early as 1435, which probably obstructed the view).<sup>5</sup>

Furthermore, there is no reason to suspect that viewers would not have been able to see both of these works at relatively close range in these contexts. Whereas Sterling suggests a distinction between works intended to be viewed at distance and works intended to be viewed from close range, I would suggest that all of van Eyck's paintings operate on the assumption that viewers will change viewing distances as they look at the works and the illusion of detail will normally be tested or verified by close scrutiny. Depending on the context of their use and display, van Eyck's works adopt different strategies in response to this expectation.

#### 4.3.1. Large Paintings and the Ideal of Infinite Description

Compared with Rogier van der Weyden's large-scale images, van Eyck's large paintings seem ostensibly less well-suited to being viewed from a distance. Two of Rogier's largest works, the *Scheut Crucifixion*, painted c.1454-55 (325cm x 192cm) (Fig 4.10), probably displayed originally at the chartreuse at Scheut, and the *Crucifixion Diptych*, painted c.1463-64 (184.9cm x 180.3cm) (Fig 4.11), now in Philadelphia, are also two of his simplest and clearest compositions. In both works, life-sized figures in pale garments are depicted against a simple background consisting of a wall and a coloured cloth. No detail in either of these paintings cannot be perceived easily from a distance. Likewise, in his *Last Judgement* polyptych, made c.1443-51 for the altar of the chapel at the Hôtel-Dieu in Beaune (and probably itself influenced directly by the *Ghent Altarpiece*) very few forms cannot be perceived at a distance. On the exterior (Fig 4.12), relatively large representations of the patrons are set in shallow spaces against coloured hanging cloths, both wearing black. The white

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<sup>5</sup> Dhanens, 1973: 48.

sculptures are strongly modelled in stone niches. On the interior (Figs 4.13 and 4.14), the composition operates on a horizontal axis, with the Divine hierarchy on the upper register and the people rising from their graves on the lower register both radiating out from the central panel occupied by Christ and St. Michael. As there is very little recession into space, figures and features of the landscape do not diminish in scale. Effectively, all the figures in the painting inhabit the foreground and are consequently large enough to be seen easily at distance. (The same concern with distance viewing over close viewing also applies to his treatment of detail in this painting, as I will discuss later).

What we know of Robert Campin's large works reflects the same concerns evident in Rogier's practice. Each of the three Flémalle panels, like Rogier's two Crucifixion paintings, show full length figures against flat, cloth or stone backgrounds. Assuming the *Thief on the Cross* (Fig 4.15) originally formed part of a composition like the copy now in Liverpool, this painting (which must originally have been around 4 metres wide when opened) also had, like Rogier's *Last Judgement*, a very strong horizontal emphasis, with figures all inhabiting the foreground space around Christ's body. What remains of the painting shows that the background landscape (Fig 4.16) was very schematically painted, with only the minimum level of description required to articulate the spatial device of the road winding through the hills. The landscape was evidently conceived primarily to be viewed from a distance and not to be scrutinised at close range.

In contrast to Rogier's *Last Judgement*, which uses large-scale figures in a relatively shallow space to facilitate visual clarity, the *Ghent Altarpiece* uses scale and spatial recession to actively prevent viewers from resolving much of its detail. In the Annunciation scene (Fig 3.69), for example, Gabriel and the Virgin (both nearly one metre high) are large enough to be seen clearly from a distance, but details in the

townscape behind them – populated with tiny figures, including a man leaning out of a window across the street (Figs 4.17 and 4.18) – can only be resolved at very close range. Similarly, on the interior, the Adoration of the Lamb is far smaller in scale than the rest of the altarpiece. Recognisable plants in the paradisaical landscape are shown with individually articulated leaves and flowers (Fig 4.19) which are only fully resolvable at a distance of around one metre. Only in the extreme distance are flowers and leaves described more illusionistically. On the distant hills for example, flowers are described more economically with coloured dots (Fig 4.20), although these appear entirely convincing even at very close range. Similarly, the distant buildings (Fig 4.21) appear to have been painted with a much greater resolution of detail than is likely to have been visible to most viewers.<sup>6</sup> As the landscape appears to recede to infinity, the description of these distant forms also creates an illusion of infinite description which does not break down even at close range.

In comparison, Rogier's *Last Judgement* is far less consistent in its description of detail. For example, the plants in the foreground (Fig 4.22) are comparable with those in the *Ghent Altarpiece*, but as they do not recede into space, their scale does not diminish. Also, many of the souls of the dead are very awkwardly painted in comparison with van Eyck's figures. Whilst textures such as the hair and skin of figures are finely articulated in the Adoration of the Lamb (Fig 4.23), textures are only schematically described on most figures of a similar scale in the *Last Judgement* (Fig 4.24). To some extent, the illusion of detail is broken in Rogier's altarpiece by the inconsistency of its description.

Significantly, even some of the forms in the *Ghent Altarpiece* which were essential to reading its iconography are not visible at distance. Notably, the Lamb of

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<sup>6</sup> Much of the distant landscape has been over-painted, but the area to the top left appears to have retained most of its original paint surface. Coremans, 1953: 106-14, pls. xxx-xxxii, and van Asperen de Boer, 1979: 185-88.



God – the focal point of the open altarpiece – is only around 10cm high. Likewise, the jewels in the moat surrounding the fountain of life and the water that spouts from its marble basin and runs down the gully toward the viewer, are only visible at relatively close range. (Fig 4.25 shows this detail to scale). It seems possible, as Lynn Jacobs has argued in the context of later carved altarpieces,<sup>7</sup> that the miniaturised scale of the central interior view was intended to instil a particular sense of sanctity by preventing viewers from reading all of its detail at distance. Only viewers privileged with a close-range view of the panel would have been able to verify exactly where description breaks down.

Whether this illusion was designed from the outset is difficult to assess. As little is currently known of the early history of the altarpiece (prior to 1432), the extent to which discontinuities and contrasts of scale were planned is, to a certain extent, a matter of conjecture. First, it is not known whether the lower register was painted as part of an earlier phase of work, (perhaps even part of a separate commission) and, if so, what were the respective roles of Hubert and Jan.<sup>8</sup> Second, a plausible argument has been made that the Adoration of the Lamb may have been displayed elsewhere in the cathedral before being assembled in the Vijd chapel in 1432.<sup>9</sup> Whilst these issues cannot be entirely surmounted, it is nevertheless worthwhile – especially in the absence of other works by Jan of comparable size and scale – to consider how the scale and detail of the altarpiece related to the spatial context for which Jan was asked to finish and assemble it in 1432. Although parts of

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<sup>7</sup> Jacobs, 1998: 109 who also points out that medieval taste often favoured ‘multiplicity’ over consistency.

<sup>8</sup> Panofsky, 1953: 205-30 suggests that the altarpiece is an assemblage of at least three different commissions. Most of the structural, technical and iconographic concerns he put forward have since been challenged. In recent years, scholars such as Herzner, 1995 and Ridderbos, 2005 have moved toward the view that Jan was the principal or even sole creator.

<sup>9</sup> This argument was made by Hugo van der Velden in his paper ‘The Ghent Altarpiece and the Rise of Early Netherlandish Painting’, presented at the 2006 conference ‘From Icon to Art’, Walters Art Museum, Baltimore. This research has not been published at the time of writing.

the altarpiece may not have been planned for this space initially, there is no reason to suppose that Jan did not carefully consider the relationship between the different panels and their spatial setting.

In its original installation in the Vijd chapel, the altarpiece was probably raised on some kind of platform such as the 'predella' in the reconstruction proposed by Dhanens (which also includes an intermediary register containing a tabernacle between the two existing registers) (Fig 4.26).<sup>10</sup> On the exterior, the scale is reasonably consistent throughout. The donors – who would have been near eye level according to Dhanens's reconstruction (in which the lower register is about 1.5m from the ground) – are painted with a remarkably high resolution of detail. Compared with Rogier's portrait of chancellor Rolin (Fig 4.27), Jodocus Vijd (Fig 4.28) is described with more finely and with a greater resolution of detail. In particular, the textural details on the Vijd panel – including fine wrinkles around the eyes and subtle highlights, especially on the nose and around the mouth, indicating the lustre of skin – can only be resolved at close range. In comparison, the image of Rolin is modelled with strong shadows and textural description is comparatively schematic. In contrast to the lower register, the upper register of the *Ghent Altarpiece* implies a more distant viewpoint (Figs 3.28 and 3.29). Only from a distance of several metres does the perspective of the Annunciation chamber – which would, from afar, have appeared almost like a cut-away section of the chapel – seem visually plausible. (A closer viewpoint would have implied more of the ceiling should be visible).

When the altarpiece was open, there would have been an even greater suggestion of multiple viewpoints. A viewer standing around one metre from the altarpiece would have been able to see not only the individualised features of each of

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<sup>10</sup> Dhanens, 1969-72: 109-50 and Dhanens, 1973: 111. Dhanens' reconstruction is of course only one of many plausible solutions. The reconstruction proposed by Philips, 1971 also divides the upper and lower registers within a large tiered tabernacle with the lower register apparently near or slightly above eye-level.

the figures on the lower register, identifiable leaf shapes and perhaps familiar buildings, but also much of their textural description. Even at this range, however, description does not break down into visible marks of paint. At this distance, however, the upper register, which was probably between 3m and 4m high, would not have been comfortably visible. In order to see the figures on this register, the viewer was required to stand much further away, at which point the smaller figures on the lower register, as I suggested above, become more difficult to see. As the figure scale is significantly larger on the upper register, some textural description would have been perceivable from the ground. Crucially, most of these details, although visible, would not have been fully resolvable from this distance. For example, it would have been possible to detect the lustrous textures of the different gemstones in God's brooch (Fig 4.29). Only at close range, however would it have been possible to see how different lustre is described from the diffuse specular highlights on the pearls (suggesting a silky lustre) to the sharper highlights on the emeralds and sapphires (suggesting a vitreous lustre) and the sharp-edged highlights on the diamond (suggesting its faceted cut and hard adamantine lustre). As a means of comparison, the gemstones on the Campin *Virgin and Child* panel (Fig 4.30) are considerably more simplified and schematic. Also, hair is described on the upper register with very fine individual lines (Fig 4.31) which are likewise only fully resolvable from close-by. In other passages, however, such as Adam's legs (Fig 4.32), the larger figure scale allows individual hairs to be resolved from further away.

There are therefore a number of different viewpoints implied by the composition and scale of the altarpiece. As well as the open and closed positions, the upper and lower registers also imply close and distant viewing positions. Also, just as the lower register describes textural details to a resolution just beyond what viewers are able to resolve close-by, the larger scale of the upper register allows textural

description to be perceived, but not fully resolved, at distance.

Like the *Ghent Altarpiece*, van Eyck's second-largest painting (in terms of size and image scale), the *Virgin and Child with the Canon van der Paele*, also invites a restricted level of close viewing as a means of suggesting that objects are infinitely detailed in their description. Although the painting was displayed on the high altar after c.1588, it was originally designed for a side chapel in the south side of the nave of St. Donatian's.<sup>11</sup> Whether the panel was intended to be placed on or near the altar or separately as an epitaph, the confined space of the chapel suggests that viewers would have been able to see the painting at relatively close range. Whilst the figures are proportionally large and easily readable from a distance, the painting's emphasis on describing different surface textures invites and requires close scrutiny. Only at a distance of less than one metre is it possible to resolve such description as the network of tiny wrinkles around the canon's left eye described in mid-tone brownish-pinks and the rough line of skin that appears to be scarred (Fig 4.33). All over the surface of the skin are dots of varying tones suggesting the skin's bumpy texture and, around the mouth, stubble. On the top of the canon's head are very fine white and grey hairs, articulated individually, and some equally fine hairs catching the light just at the far edge of his right eyebrow. Similarly, the silk threads that appear to flash in St. Donatian's brocade are painted individually in very fine, sharp-edged lead-tin yellow lines which contrast with the soft blue velvet (Fig 4.34). Fine goldsmiths' work on his processional cross is described primarily in strong highlight tones and in the centre of the cross a convex piece of rock crystal convincingly displays a very small reflection of the space in front of the painting (Fig 4.35). On his morse (Fig 4.36), the differentiation between the response of the different stones to light is precisely

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<sup>11</sup> Martens, 2005: 366-77, and footnote 329 above. Although we cannot be certain whether the panel was placed in the chapel during or after the canon's lifetime, it must have been designed with its position in the chapel in mind from the outset. See also Chapter 1, n.113 and Chapter 3, n.79.

described, from the sharp highlights of the faceted, cut diamond to the diffuse highlights of the pearls. At the edges of the carpet (Fig 4.37), loose individual strands are described (some with a cast shadow). The perspective and scale of the image imply a certain distance from the viewer, but these descriptions of detail are so finely observed and articulated that they appear as they would (in reality) only at a much closer distance. The effect is a kind of enhanced image (what has come to be known as the 'microscopic-telescopic' character of van Eyck's paintings) in which everything seems more detailed than one expects it should. Even allowing for the relatively large scale of the painting, description at close range appears somehow richer and more fully resolved than one expects this scene would appear in reality.

There is, therefore, a kind of paradox in van Eyck's mode of description: representation in his painting relies on its direct relationship with the observed world, but it succeeds in suggesting this relationship by employing a form of description which is actually quite unlike real visual experience. In reality, we do not pay so much attention to details of texture, either because we are unable to resolve detail at this level or because other visual aspects take precedence. Typically, the perception of surface texture is reserved for mostly close-range viewing. In contrast, van Eyck's painting includes descriptions of textures, typically seen at close range in reality, which the viewer is able to resolve whilst viewing the whole pictorial field. The painting therefore presents the viewer with the illusion that the image has a higher resolution than an equivalent image would have in reality.

Rogier's *Descent from the Cross* (c.1430-35) (Fig 4.38), just slightly larger in scale than van Eyck's painting of van der Paele, is at least as *fine* in its execution as van Eyck's panel (in terms of the fineness of the marks made) but it does not invite the same scrutiny of its detail, nor does it provide the viewer with the sensation that the image is enhanced in its description of observed detail (what I have termed the

*resolution* of the image). The brocade worn by Nicodemus in Rogier's panel (Fig 4.39) is painted using a similar technique to that used by van Eyck on St. Donatian's brocade (Fig 4.34) but the gold threads are much finer in van Eyck's painting. The wispy hairs escaping from Nicodemus's headwear (Fig 4.40) are much like those on van der Paele's head (Fig 4.33) and both figures also have individual hairs in their eyebrows described with similar fineness. Detail is, however, subject to a certain amount of idealisation in Rogier's painting. The fine hairs that fall below the Virgin's headwear mostly fall in attractive loops (Fig 4.41) whereas the frizzy hair of van Eyck's Virgin (Fig 4.42) appears less organised and more obviously concerned with describing the texture of hair. Rogier is also more selective in his choice of how much detail different surfaces resolve in their description. Hair, for example, is very finely painted (often more finely than in van Eyck's paintings) with a high resolution of detail, but skin tends to appear unnaturally smooth, with greater attention to the description of stronger contours, bumps and folds than to the finer blemishes and wrinkles which describe the texture of the skin. (Compare the description of Nicodemus's face (Fig 4.43) with van der Paele's, for example (Fig 4.33)).

Another significant difference between the two artists, evident in these paintings, is that van Eyck seeks to include and describe a large number of small and fine objects and patterns (gemstones, goldsmiths' work, fine geometric tile patterns, finely carved capitals), whereas in Rogier's painting only a few objects which are themselves finely made (the trim of Joseph of Arimathea's clothing (Fig 4.44) and also Mary Magdalene's belt) are depicted. Van der Weyden's painting, in fact, contains few of the visual clues, found everywhere in van Eyck's work, that the painting requires close inspection in order to see the full level of detail. Whilst the intricate patterns and objects in van Eyck's painting provide a certain assurance of detail and an invitation to examine this claim more closely, Rogier's painting does not

suggest or invite this kind of scrutiny and is consequently less concerned with signalling the fineness of its execution to its viewers. Although many of the finest passages of Rogier's works are comparable with the finest parts of van Eyck's paintings, fineness tends to be more selective or inconsistent. In contrast, although the execution of van Eyck's painting is often no finer, it is more consistent and more efficiently employed to describe very closely observed surface textures and very small or intricate forms.

#### 4.3.2. Small-Scale Paintings and the Perception of Brush-Marks

Compared with his contemporaries, van Eyck appears to have been a painter of primarily small and medium sized panels. Whereas nearly half (19 of 40) of Van der Weyden's paintings are on a relatively large scale (over 1 metre), all but three (20 of 23) of van Eyck's surviving works are smaller than 82cm on their longest side. Compared with Rogier, whose workshop was regularly commissioned to paint large altarpieces, most of van Eyck's private commissions were apparently for works destined for either small chapels or private domestic spaces. Many of the smaller examples were probably designed to be portable, folded and unfolded like a book, held in the hands or set on a table. It appears compositional and geometric allowances were even made for the angle at which the opening panels of small diptychs such as the Thyssen-Bornemisza *Annunciation* (Fig 3.77) were to be positioned.<sup>12</sup> When not in use, they would have been protected by some kind of *couverte*, which may have taken the form of a leather or fabric case, wrapping or bag or, in the case of folding diptychs, simply the paint on the exterior of the panels.<sup>13</sup> Without exception, they

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<sup>12</sup> Eisler, 1989: 59 has suggested that the diptych was non-folding and intended to be viewed from a position to the right. However, alterations in the paint layers suggest that van Eyck was making allowance for the viewing angle of a folding diptych, as Preimesberger, 1991 suggests. See also Hand, Metzger & Spronk, 2006: 70-74.

<sup>13</sup> Verougstraete & van Schoute, 2000: 114.

would have been subject to very close scrutiny as part of the routine of their regular usage. In the context of such close-range habits and practices of viewing, these works encourage their viewers to scrutinise and often to test this visual claim in a way that works by his contemporaries do not to the same extent. Moreover, these works also prevent their viewers from verifying their status as paintings by combining a fineness of execution and a high resolution of observed detail with a concern for making brush-marks largely imperceptible.

A comparison between van Eyck's *Rolin Virgin* (Fig 2.10) and Rogier's *Saint Luke Drawing the Virgin* (Fig 4.45) illustrates the major differences between the two artists' respective approaches to detail. Both paintings derive from the same composition (Rogier's almost certainly having been inspired by Jan's)<sup>14</sup> and both were produced for small chapel spaces. Typically, Rogier's panel is almost double the size of van Eyck's (137.7 x 110.8 versus 66 x 62), making direct actual scale comparisons difficult. However, the differing interpretation of the receding river and townscape background is particularly instructive. In Rogier's painting, several tiny figures are shown on the left side of the river (Fig 4.46). The smallest of these, including the man on horseback by the gate (Fig 4.47) and a man urinating against a wall (Fig 4.48) are slightly more fully articulated than van Eyck's figures (Fig 4.49), but they are also generally larger in scale. Also, the overall consistency of detail in Rogier's painting is more variable than with van Eyck's and there are comparatively far fewer small and fine elements.

In Rogier's painting, the buildings and figures in the background function primarily to establish spatial recession and show minimal interest in the idea of constructing a plausible landscape vista. (The peopled landscape develops a narrative function in Rogier's work during the 1440s but his backgrounds remain very sparse

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<sup>14</sup> De Vos, 1999: 202.



compared with van Eyck's). Where van Eyck describes multiple streets with houses, shops and churches, Rogier places a large structure at each side of his composition which makes the change of scale less dramatic and considerably reduces the available area for describing more distant forms. In contrast, van Eyck's panel describes hundreds of figures in the background, mostly in groups, implying a secondary narrative set in a fully described townscape. Such clusters of figures as those gathered outside the church (Fig 4.50) and those riding and walking across the bridge (Figs 4.49) and through the town (Fig 4.51) encourage the viewer to read their implicit narratives, adjusting to the change in scale and spending time following their path along streets and across the river. There is no such invitation in Rogier's panel where the handful of figures and relatively bare landscape only momentarily distract the viewer from the foreground narrative.

Not only in the background but throughout van Eyck's painting, there is a fascination with describing the smallest and finest of forms which, as I have already suggested, is a less consistent feature of Rogier's practice. In the foreground, the tiles on the floor follow a more intricate and complex pattern, the column capitals are carved with intricate interlace forms and the walls are embellished with carvings such as the rinceau pattern of the archivolt. Rogier's tiles, by comparison, follow a simple pattern and the interior space is plain. Although van Eyck's painting is half the size of Rogier's, it succeeds in describing a much greater range and number of small or fine forms.

As with van Eyck's larger panels, description in the *Rolin Virgin* appears somehow more detailed than one expects it would in reality. The description of tiny figures in the background of van Eyck's painting, which can only just be resolved with the naked eye at close range, is matched by an equally descriptive approach to textures in the foreground, from the silk velvet pile, fur and gold threads of the

chancellor's gown (Fig 4.52) to the stubble on his chin (Fig 4.53). In real visual experience, it would not be possible for the viewer to resolve such foreground details at the same time as being able to resolve similarly sharp details in the landscape vista behind. In this respect, van Eyck's painting shares a characteristic common to images produced by convex mirrors which deserves specific mention at this point. Convex mirror images reduce the scale of the subject considerably, but the apparent resolution of the image is not reduced. Rather, the smallest and finest parts of the image, such as visual indications of texture, will tend to appear miniaturised but resolvable. As the entire image field is reduced, it is also easier to view distant objects at the same time as foreground objects. As convex mirrors act like concave lenses, they also tend to sharpen distant details for any viewer with less than perfect distance vision.

Rogier's approach to detail is comparatively selective to the point that only certain parts of the image, as opposed to the whole image field, appear more or less fully described. Whilst most surfaces are very fully described (St. Luke's face (Fig 4.54), for example is particularly fine) many other objects and surfaces are comparatively schematic or simplified. Compared with the plants in the middle-distance of van Eyck's painting (Fig 4.55), those in Rogier's painting (Fig 4.56) look like a flat pattern (making allowance for discoloration of the copper-based green). Likewise, each of the floor tiles in van Eyck's painting is rendered with concern for their texture, including very delicate highlights on their edges describing the sheen of their glaze (Fig 4.57). In comparison, it is difficult to work out exactly from what material the tiles in Rogier's painting are made (Fig 4.58).

Many of the differences between van Eyck's treatment of detail and the approach of both van der Weyden and Campin are most apparent in their independent portrait panels. Van der Weyden and Campin generally painted on larger panels than van Eyck, with Rogier's panels averaging around 41.5 x 28.4 cm, Campin's averaging

36.9 x 24.7 cm and van Eyck's averaging just 24.6 x 17.8cm. (Appendix 1 shows the dimensions of all portrait panels attributed to these artists). The scale of the subject is also significantly smaller in van Eyck's portraits, in which the size of the subject's head on average measures 10.9cm (three quarters of these within the range 9.4 to 10.1cm) compared with van der Weyden's subjects which measure on average 16.1cm (range 14.1 to 18.3 cm). The portraits attributed to Campin (including the Berlin *Stout Man* and the London portraits of a Man and a Woman) are even larger in scale, with the subjects' heads averaging 20.2 cm – twice the scale of those in van Eyck's portraits.

Although van Eyck's portraits are smaller in scale than those by van der Weyden and Campin, the fineness of description is more consistent and the resolution of observed detail greater. Compared with Rogier's *Portrait of a Woman*, painted c.1432-35 (Fig 4.59), for example, van Eyck's portrait of his wife, *Margaret van Eyck*, is smaller in scale but includes finer description of different surface textures. Rogier idealises his subject, with soft blended tones under the nose and around the mouth and soft, blended highlights on the cheeks, nose and chin suggesting the smoothness of the girl's skin (Fig 4.60). In doing so, fine detail is sacrificed to a more suggestive mode of depiction. Van Eyck is less flattering in his portrait, describing very fine wrinkles under Margaret's eyes and using tiny highlights on the nose and around the mouth and eyelids to indicate a glossy texture to the skin (Fig 4.61).

Unlike van Eyck, van der Weyden varied his treatment of detail according to the nature of his subject. Typically, his portraits appear inconsistent in their observation and description of detail. As with his larger works, certain details, especially jewellery, are described very finely but other surfaces, such as the texture of skin and detail in the eyes, is often much less fully described. In his *Portrait of a Lady* of c.1463-64 (Fig 4.62), the intricate goldsmiths' work of the lady's gold buckle

is very finely articulated (Fig 4.63), but the painting otherwise shows no interest in the rendering of detail, especially in the description of textures. (Most instructive is the lack of detail in the subject's eyes (Fig 4.64)). Even more so than in his *Portrait of a Woman* (Fig 4.59), this later portrait apparently uses a highly idealised and also much more simplified style. Certainly both Rogier and Campin treated the description of texture in a simpler, more idealised way in their portraits of women. The London *Portrait of a Woman*, usually attributed to Robert Campin, for example, is treated quite differently to the companion portrait of a man. Whilst the man's skin appears rubbery and wrinkled (Fig 4.65), the woman's skin appears to have an almost porcelain-like texture, free from even the finest wrinkles (Fig 4.66). Also in terms of technique, the artist responsible for the female portrait has used a higher proportion of admixed white, producing softer pastel hues in the skin tones.<sup>15</sup> In comparison, van Eyck's portrait of his wife (Fig 4.61) is no less finely described than his (self-?) portrait of a *Man with a Red Chaperon* (Figs 4.8 and 4.67).

Significantly, portraits of men by Campin and van der Weyden are also much less detailed than those by van Eyck, suggesting that any idealising tendencies in their female portraits can only partially account for variations in the level of detailed description. Compared with van Eyck's *Portrait of a Man (Self-Portrait?)* (Fig 4.67), even Campin's finely painted *Portrait of a Man* (Fig 4.68) is less descriptive in the treatment of the skin's texture and of detail in the eyes. Instead, Campin's painting relies (very successfully) on strong tonal modulation to indicate the contours of the face. Comparing the area around the eyes in van Eyck's *Portrait of a Man (Self-Portrait?)* with Rogier's *Anthony of Burgundy* (c.1461-62) (Fig 4.69) shows that

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<sup>15</sup> The discrepancy in style and technique has caused some scholars such as Frinta, 1966 and Thürlemann, 2002 to suggest that a different artist, perhaps a young Rogier van der Weyden, was responsible for the *Portrait of the Woman*. The fact that both panels have supports from the same tree, are of the same dimensions and have been prepared with the same priming suggests that these paintings are, however, at least products of the same workshop (Campbell, 1998: 72).

Rogier's description is also comparatively crude. The creases of the eyelids in van Eyck's painting vary in tone from a dark brown to pink, terminating in fine points, whereas the creases of the eyelids in Rogier's painting consist of two comparatively broad lines of the same pigment which terminate quite abruptly. In the eye itself, Rogier's portrait shows the visible part of the tear duct as a triangular patch of pink with a reddish-pink line at its upper edge whereas van Eyck modulates the tones of pink with more subtlety, adding tiny highlights to suggest glossiness and articulating fine veins in the sclera. The highlights on the surface of the eye in van Eyck's painting are made up of a combination of at least seven small, separate marks compared with the three larger marks on Rogier's painting. The description of stubble in Rogier's painting (Fig 4.70) is only articulated in strong dark and light tones in areas of shadow, primarily on the underside of the chin, whereas van Eyck's painting describes tiny hairs very finely and in strong tones on the whole cheek and also around the mouth (Fig 4.71). Most impressive in van Eyck's painting are the very subtle bumps in the skin, articulated in tiny reddish-pink marks, to the proper left of the nose, just below the eye which are just barely visible to the naked eye. This level of observation is far beyond anything provided by Rogier's portrait relating to the texture of the skin.

The fineness of van Eyck's paintings is not only a matter of how much fine description his technique allowed him to articulate. An equally significant characteristic of his work is the remarkable absence of visible brush-marks, even at close proximity. To a certain extent, this absence is a primarily technical issue: using medium-rich paint, applied thinly with a soft brush, he was able to produce passages of colour which would level out to a smooth, enamel-like film, almost free from brush-marks. It is also true that thinner paint (by which I mean with a greater proportion of medium) would have facilitated the execution of the finest marks,

allowing a fluid application with the point of the brush. We must, however, be careful not to present these aspects of van Eyck's practice as by-products of his chosen materials. Rather, his decision to use oil paint in the way he did was more likely guided by pre-existing, albeit developing, ideas about how he wanted his paintings to look. Moreover, the technical explanation can only account for the absence of brush-marks in certain cases. In all paintings, brush-marks are visible as part of the language and syntax of their description. Whether these marks are viewed as traces of the artist's hand or purely as part of the descriptive function of their language depends on how the viewer interprets them or, more specifically, how the painting instructs the viewer to interpret them. The ways in which van Eyck's paintings use this ambiguity between descriptive language and description itself allows them to deny the existence of the artist's hand. This effect is a particularly important aspect of his smaller paintings on which finer marks are viewed at close range.

Brush-marks in van Eyck's paintings almost always seem to equate to description. Even where the descriptive purpose of the paint is either implicit or not obvious, the artist's hand is rarely detectable. Looking at the hands of Jan de Leeuw (Fig 4.72) and 'Tymotheos' (Fig 4.73) at 2x magnification, it is difficult to make out the language of the brush-marks. Only in the darkest and lightest tones are individual marks distinguishable, and even then they appear to describe the texture and the folds of skin. In the mid-tones, marks are blended out and tones modulate smoothly. Looking at the hands of Rogier's *Portrait of a Woman* at the same magnification (Fig 4.74), it is clear how much more perceptible are the artist's brush-marks at close range, most noticeably in the highlight tones which have been hatched in relatively thick strokes of white over the mid-tone pinks. This hatching of highlights in the surface layer is typical of Rogier's technique (see for example the draperies in the

*Bladelin Altarpiece* (c.1445-48) (Fig 4.75))<sup>16</sup> and is particularly noticeable in parts of his paintings that appear to have been painted by workshop assistants who apparently used a less-refined Rogierian technique (the faces of the celebrant and the bride in the Marriage scene of the *Seven Sacraments Altarpiece* (c.1440-45), for example (Fig 4.76)).<sup>17</sup>

As I noted earlier, brush-marks are most noticeable in smaller images which require very close viewing. Van Eyck's small-scale paintings (including the *Berlin Virgin in a Church*, the *Dresden Triptych*, both versions of *Saint Francis Receiving the Stigmata* and, to a lesser extent, the *Virgin by a Fountain*) use a number of very sophisticated methods to disguise visible brush-marks that are not used in his larger works. Each of these methods manipulates either how much detail the viewer is actually able to resolve with the naked eye, or suggests in passages of the finest description that the image itself (not how the image has been painted) is restricted in its resolution in much the same way that vision itself is restricted.

The 1.4x magnified image of the landscape in Rogier's painting of *Saint Catherine* (c.1430-32) (Fig 4.77), shows how the grass is made up of green and brown dots of paint, with pale yellowish-green dots to indicate the foliage on the trees. Whilst we might readily interpret these marks as signifying elements of the landscape, it is also quite obvious that we are looking at distinguishable marks of paint. A detail of van Eyck's *Turin Saint Francis Receiving the Stigmata*, also magnified 1.4x (Fig 4.78), shows in comparison with Rogier's painting very few marks which are readily distinguishable as brush-marks. Again, the reason for this is not simply that van Eyck's paintings are finer than Rogier's. Rather, it is an issue of how van Eyck uses the finest of marks in such a way that they suggest not that the

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<sup>16</sup> This aspect of Rogier's technique was discussed in the previous chapter.

<sup>17</sup> De Vos, 1999: 223-24.

artist was limited in his capacity to paint finely (by the size and shape of the brush and by his sight), but that parts of the image itself are limited in their resolution of detail. This use of 'suggestive detail' is most evident in the finest marks of van Eyck's smallest paintings, which are just barely resolvable to the naked eye. A particularly good example of this approach is the description of the statue in a niche behind the Virgin in the *Virgin in a Church* (Fig 4.79). The marks van Eyck uses here actually appear to indicate that this part of the image is slightly out of focus, as opposed to being limited by how finely the marks can be applied. Similarly, a comparison between the Virgin's throne in van Eyck's *Dresden Triptych* (Figs 4.80 and 4.81) and similar details in van der Weyden's *Virgin and Child in a Niche* (c.1430-32) (Fig 4.82) and *Virgin and Child Enthroned in a Niche* (c.1425-30) (Fig 4.83) demonstrates the difference between the approaches of the two artists. In Rogier's painting, edges are painted sharply, with strong contrasts between highlights and shadows. The sharp edges allow the viewer to trace the language of most of the brush-marks. The goldsmiths' work on van Eyck's throne is rendered in a less literal fashion, using marks which suggest the form of the objects, rather than fully describing them. Edges appear much less sharp than those in Rogier's painting and it is consequently more difficult to determine exactly how each mark was formed with the brush.

Van Eyck uses this suggestive blurring effect in parts of his small paintings where the finest description is required. In some cases, a soft, blurred effect is used in place of marks which would otherwise be too fine to articulate due to the scale of the image. The Virgin's hair in the Berlin panel (Fig 4.84) and St. Catherine's hair in the Dresden panel (Fig 4.85), for example, are painted using a soft, blended technique which is quite different from the literal description of individual hairs that Rogier uses on his painting of St. Catherine (Fig 4.86). Van Eyck most often makes use of this suggestive blurring technique in his descriptions of sculpture and fine goldsmiths'



work, and the effect is most pronounced where such objects are depicted in the more distant background. A close modern comparison with this effect is the principle of photographic 'depth of field', whereby objects become increasingly blurred as they become more distant. It is striking how similar the middle distance objects appear in the example photograph (showing chess pieces) (Fig 4.87) to parts of van Eyck's paintings such as the gold statue in the Berlin *Virgin in a Church* (Fig 4.79) in which all of the highlights and mid-tones have soft, blended edges. Where van Eyck's use of this effect differs from photography is that he applies the blurring selectively to small, intricate objects whereas photographs blur everything on the same plane irrespective of size. Most likely, the effect derives from the accuracy with which van Eyck represented what he saw: intricate objects, especially metallic objects, become increasingly difficult for the eye to resolve the more distant they are, and consequently appear slightly blurred. The fact that the effect is strongest in his smaller works suggests, however, this was not simply a product of his observational accuracy but also a means of preventing brush-marks from being distinguishable at close range. In short, it prevents the viewer from verifying that the image is a painting.

A second strategy employed by van Eyck's small paintings is the use of marks which are literally smaller or finer than most viewers are able to resolve with their naked eye. The following section considers this aspect of van Eyck's practice, with particular emphasis on the smallest of van Eyck's surviving paintings, the Philadelphia *Saint Francis Receiving the Stigmata*.

### **4.3.3. Small-Scale Painting and the Magnifying Lens**

The following discussion will argue that both van der Weyden and van Eyck were using some kind of magnifying lens as an aid to painting during the 1430s. At this time, these two artists were both producing very small independent paintings in

which tiny figures are represented in a background landscape which can only be properly resolved with a magnifying lens. However, whilst both artists painted images that require and invite close inspection, probably using a lens, only van Eyck's images succeed in hiding traces of the artist's hand under such close scrutiny.

Both the Philadelphia and Turin paintings of van Eyck's *Saint Francis Receiving the Stigmata* (Figs 4.88 and 4.89) are among the smallest and most finely detailed works attributed to van Eyck. Although there is still disagreement over the attribution of the paintings and their relationship to each other, there is, in my opinion, no reason to doubt that both works are products of van Eyck's workshop and most likely the work of Jan himself.<sup>18</sup> As Marigene Butler has argued, the brushwork of both paintings seems to be by the same hand, the wood used as a support for the Philadelphia painting comes from the same tree as two other paintings produced in van Eyck's workshop and both paintings are of an outstanding quality comparable with other paintings securely attributed to Jan himself. The only serious question over the attribution of the Philadelphia painting appears to stem from the fact that exact copies of paintings do not survive from earlier than 1454 (Cambrai *Notre-Dame de Grâce*).<sup>19</sup> The lack of a surviving precedent, however, does not in any way reduce the possibility that the Eyckian paintings of St. Francis represent the first example of an artist producing two versions of an image. Furthermore, few, if any, artists other than van Eyck would have been capable of reproducing the same image with the degree of exactitude demonstrated by the two paintings.

In the 1997 report of the technical investigation carried out on the Philadelphia *Saint Francis* (1983-1989), the head conservator, Marigene Butler makes some interesting comments about the nature of detailed description in the painting:

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<sup>18</sup> This is also the view of Butler, 1997.

<sup>19</sup> van Asperen de Boer, 1997: 58-59 raises this doubt. He does not, however, rule out the possibility that the Philadelphia painting is by van Eyck.

...the use of magnification enhances appreciation of the incredible detail and the similarity of the brushwork to that seen more readily in the Turin painting. With magnification, one can see the tiny figures of animals, or people making their way along paths on the distant hillside or engaged in commercial activity along the city wall at center.<sup>20</sup>

She goes on to discuss the language of brush-marks visible under magnification:

Wildflowers which are easy to distinguish in the Turin painting can, with magnification, be seen to have been depicted in complete, although minute detail in the Johnson painting, using exactly the same language of brush strokes as in the larger painting. What appears to the naked eye in the Johnson painting to be a single delicate brown line defining form in St Francis's fingers or in the folds of his robe, can, with magnification, be seen to consist of a succession of extremely delicate strokes, similar to the hatching of the Eyckian underdrawing in the Turin picture and in other painting by Jan van Eyck. One concludes that some form of magnification must have been used by the painter who created the Johnson painting.<sup>21</sup>

Butler's concluding remark, that the painter must have used some form of magnification (a lens), is based on her observation that the full description of detail in the painting can only be perceived when the painting is magnified. Although the purpose and scope of Butler's discussion prevents her from fully articulating a detailed reasoning behind her conclusion (I will discuss the problems associated with the claim next), her overall analysis is, in my opinion, accurate. In order to substantiate the claim, I would like to offer further observations based on my own

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<sup>20</sup> Butler, 1997: 34.

<sup>21</sup> Butler, 1997: 34.

inspection of the painting. (Fig 4.88 shows a 1:1 scale image of the painting to which the reader is referred for the following discussion).

To begin with, in order to see even basic details that describe the textures of objects, one must view the painting at a very close distance (of around 20-30cm). As finer details such as the figures in the background and creases in St. Francis's skin draw the viewer closer to the image, it becomes apparent that many details are not fully visible with the naked eye. Just above Francis's hands, it is possible to see two figures, one wearing red headgear, on a white horse and beside them a black horse carrying a figure in black. Slightly further along the path, it is possible to make out a whitish shape above a red shape, below which is an area of grey which almost blends into the vegetation around it. Further along this path are several dots which suggest people walking. It is not possible to make out their form. Around the gateway to the city are a number of small lines and dots which read quite easily as people, a few of which are on horseback. It is not possible to make out what the people are wearing, nor are any of their limbs visibly articulated. As well as the small figures in the background, some of the finer details in the foreground are also difficult to see with the naked eye. St. Francis's stubble is just barely perceptible, but individual hairs are too fine to make out clearly. Likewise, his eyebrows appear as two solid lines – no hairs are apparently articulated. The creases and cracks in the bottom of Francis's feet and the palm of his left hand are perceptible and it is possible to make out the fingernails of Francis's right hand and the toenails of brother Leo's left foot (nearest the rocks). Individual blades of grass can be made out and different shapes of wildflowers in the grass are just visible. It is important to clarify that some of the features – such as figures in the background – which Butler states can be seen “with magnification” are also visible with the naked eye. The finest parts of these details

are, however, at the limit of what the eye is able to resolve without the aid of a lens.<sup>22</sup> Consequently, it is necessary to examine the painting at the closest distance at which one is able to see the painting in focus (the near point). Even then, one is able to detect that finer detail might be visible with the aid of a lens.

Looking at the painting using a 2x magnifying lens, one is able to make out details that are either not visible or not fully resolvable with the naked eye. For the most part, the lens does not reveal any elements that are not perceptible to the unaided eye, but rather shows a greater degree of articulation than is apparent without the lens. Although the figures around the city gate were visible without the lens, using the lens it is possible to make out, for example, the legs of a figure wearing white headwear directly in front of the gate and to make out the outstretched arms of the figure in the far right side of the boat in the water (Fig 4.90). Looking again at the figures making their way along the path (Fig 4.91), the lens shows that the whitish shape above the red shape is articulated in the form of a hat, whereas to the unaided eye, this appears as a dot. The lens also confirms figures further along the path which are only just visible to the unaided eye. In the foreground, it is possible to see creases in Francis's feet (Fig 4.92) and also in his hands (Fig 4.93) which are so fine that they are not visible without the lens. It is also possible to see individual specular highlights in the drops of blood on both of his feet and his right hand. Brother Leo's right hand has carefully articulated highlights on each of the knuckles which are not distinguishable without the lens (Fig 4.94). Brother Leo's nearest foot has highlights on each of the toes which appear to the unaided eye to be single blended dots but are, in fact, made

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<sup>22</sup> Being slightly short-sighted, I have a near point of around 10cm, which allows me to look at the painting at a closer distance than someone with normal vision who would have a near point of around 25cm.

up of multiple brush marks (Fig 4.95). Highlights in toenails and fingernails are clearly visible with the lens and it is also possible to see the dirt in the nails of Francis's right hand (Fig 4.93). The lens shows clearly the individual dots that make up Francis's stubble and it is possible to see some fine dots on his right eyebrow which are also not visible without the lens (Fig 4.96). In addition to these very fine details, all details which are barely visible without the lens, such as the wildflowers (Fig 4.97), can be distinguished clearly and easily with the lens.

This description provides evidence for a number of specific details in the painting which are only visible when using a magnifying aid. In addition to these, it is important to reiterate that all details might be appreciated more fully under magnification and that even under a magnification of 2x, brush-marks are still barely visible.

Van der Weyden's painting of *Saint George and the Dragon* (c.1432/35) (Fig 4.98) measures just 14.3 x 10.5 cm and includes in its background a walled city, overlooked by a castle, in which a number of tiny figures are represented. Like van Eyck's paintings of St. Francis, some of these, including those walking up the path to the castle and three figures looking out of the castle windows, can only be seen easily with a magnifying lens. Although these figures are not obviously part of the painting's narrative, the composition of figures riding and walking a path that winds into the distance (Fig 4.99) clearly invites the viewer to follow their trail and to scrutinise the background in an attempt to identify what the figures are doing. Likewise, beyond the city, four boats have been painted on the water, each seemingly demonstrating how the artist is able to paint the same object on an increasingly smaller scale. The painting is however, like Rogier's larger works, inconsistent in its fineness. Whilst details in the background are extremely finely articulated, parts of the foreground and middle-ground are less fine in their execution and reveal evidence of the painter's

hand. The house behind George's raised arm is rendered in plain flat colours with no textural description, and grass and foliage are painted in distinguishable dots of paint. George's face is also painted in a simpler manner, relying primarily on admixed black and heavy outlines (around the profile of the face and around the eyes and mouth) to describe form.

Compared with van Eyck's painting of St. Francis, Rogier's painting reveals the language of its brush-marks more readily. Whereas van Eyck consistently hides the language of his mark-making by ensuring that the finest brush-marks are always suggestive of description, Rogier makes extensive use, especially in the landscape, of a stippling or dotting technique (Fig 4.100) which on close inspection (and under magnification) does not suggest a correlation to fine description and therefore reads clearly as a sequence of distinguishable brush-marks. Almost certainly the difference in style and technique between Rogier's small panel and van Eyck's is associated with how the two artists differed in their understanding and approach to the oil medium. In some respects, the style and technique Rogier employed has much in common with the appearance of (tempera) manuscript miniatures in which marks tend to be visible. Van Eyck's painting, however, makes full use of the qualities unique to oil paint, producing imperceptible blends between hues and tones and a greater range of consistently fine marks.

Because tempera (including glair, gum arabic and other gums) requires the painter to use disengaged brushstrokes, manuscript illuminations tend to have a visible descriptive language of marks. In the *Très Riches Heures* calendar miniatures, painted by the Limbourg Brothers 1411/12–1416, passages of short lines or dots, usually placed over a solid paler under-layer, are used to vary the tone and saturation of colours. In the August miniature (fol. 8v.) (Fig 3.101), for example, disengaged marks describe the figures and horses as well as forms in the landscape, applied closer

together to suggest darker (or more saturated) parts of surfaces and further apart to describe lighter areas. The same technique is employed consistently throughout the Limbourg miniatures to describe changes of hue and tone, indicating volume, light and shadow. Variants of this same basic technique are common to all manuscript miniatures throughout this period. In some cases, such as the buildings in the Flight into Egypt miniature (fol. 106r.) of the *Très Belles Heures de Notre-Dame*, (Fig 3.102), the artist (Jacquemart de Hesdin) has used a series of short disengaged lines to establish tonal variation. Likewise, in the *Châteauroux Breviary*, the Boucicaut Master has used various hatched strokes to vary tones, most evident in areas such as the sky (for example, fol. 237r. shown in Fig 3.103) where more dramatic changes in tone or hue occur. Throughout these images, the tempera medium dictates that the painter should apply a disengaged technique of application, irrespective of how this language relates to the actual texture of the object being described. Consequently, most manuscript miniatures take on a texture, imposed onto the image, which is derived from the language of the artist's hand more obviously than from the texture of the depicted surface.

These same visual characteristics are also found in parts of Rogier's small-scale paintings, such as the St. George panel. Certain areas of this painting (Fig 4.98), such as the shadows on the horse and on the ground below, have a dotted, grainy appearance which does not obviously relate to the texture of the object or to the requirements of the medium used (oil, in this case). Even in areas which could easily have been blended wet-in-wet, such as George's armour (Fig 4.99), transitions between light and dark have been articulated with short, disengaged strokes. Similarly, as in many of his larger paintings (see above), Rogier applied modelling highlights hatched in visible strokes in areas such as the red drapery on his painting of *Saint Catherine* (Fig 4.104). This method of application is more typical of tempera



than oil and consequently the parts of the painting have a similar appearance to tempera, especially under magnification.

Whilst there is a possibility that Rogier's St. George panel was influenced, to a limited extent, by the characteristics of tempera paintings, there are no indications, beyond a correspondence in size, that van Eyck's small-scale paintings derive from his involvement with manuscript illumination. In fact, as the above analysis of the St. Francis painting shows, van Eyck relied on the properties of oil to produce passages of extremely fine description which would not have been possible using tempera. Furthermore, the only manuscript miniatures of this period which bear a significant similarity to van Eyck's small oil paintings in their descriptive language are the illuminations of the *Turin-Milan Hours* which were probably painted by van Eyck c.1422-25.<sup>23</sup> (In this group, I include the initial, bas-de-page and miniature of Milan fol.93v. (Figs 4.105-4.109 and 4.110-4.112) and the miniature and bas-de-page of Milan fol.116r. (Figs 4.115 and 4.116)). Contrary to showing that van Eyck's interest in painting on a small scale derived from manuscript illumination, these images actually suggest that he was adapting effects typical of oil paintings to the tempera medium.

Generally, the Eyckian Turin-Milan miniatures are finer in their execution than most other miniatures of the period. Many of the marks making up the rounded shapes of the stone mouldings on fol.116r, for example, are only clearly visible under magnification. What sets these images apart from those by earlier and contemporary artists is not however the fineness of their execution, but the way in which fine marks are consistently used to suggest closely observed description. As with van Eyck's oil paintings, the finest marks tend to describe surface textures such as ripples in the water on the bas-de-page of fol.93v. (Figs 4.108 and 4.113) and, in the miniature on

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<sup>23</sup> On van Eyck's authorship of the illuminations see van Buren, Marrow and Pettenati, 1996 with full bibliography. For an opposing view, see Reynolds, 2000.

the same folio, the fibres of the basket under the table (both of which are only clearly visible under magnification) (Figs 4.107 and 4.112). In other passages, where forms become too small to articulate literally, marks instead describe how light responds to surfaces such as the fine white lines of Zachariah's beard on fol.93v. and the single highlight that suggests the shape of his nose (Figs 4.105 and 4.110).

Fine brushstrokes are also used in these illuminations to suggest the blended tonal transitions typical of oil paintings. Whereas earlier artists tended to use a visible network of marks, disengaged strokes are applied so closely together in areas such as the draperies and the folds of the bed on fol.93v. that they are difficult to resolve with the naked eye. Although visible at 2x magnification (Fig 4.111), marks are almost imperceptible at 1:1 scale, producing a kind of 'virtual blend' which mimics the wet-in-wet blends of oil. Likewise, the fineness of marks on fol.116r. allows the painter to produce a series of apparently unbroken lines which describe the rounded shapes of the moulding on the arch and vault ribs (Fig 4.116). At 1:1 scale, however, the same lines are barely distinguishable with the naked eye (Fig 4.115).

Perhaps the most striking correspondence with van Eyck's oil paintings is the way in which these images rely on contrasts of light and shade as the principal means of modelling and describing form. This technique is quite unlike any earlier manuscript images such as those by the Limbourgs which use a visible and readable language of marks such as hatching, stippling or outline to describe light and volume. In the *Baptism of Christ* bas-de-page (Figs 4.108, 4.109, 4.113 and 4.114), for example, the water, trees, hills, buildings and background figures have been described almost entirely according to differences in tone and hue produced by a consistent light source. Likewise, outline and the language of brush-marks are given no significant role in the description of Zachariah on fol.93v. (Figs 4.105 and 4.110). Instead, marks

such as those describing his hair and beard and the shape of his face and headwear are made to correspond with the fall of light on these surfaces.

Even in passages where disengaged strokes are visible, they are always suggestive of descriptive texture. On fol.93v., for example, instead of using a single flat colour to describe the back wall, the artist has used a series of dots and short lines in greys, pinkish browns and reddish-browns, suggesting the rough texture of the wall's surface (Figs 4.105 and 4.110). Likewise, where shadows fall on the floor by the bed and under the table, marks suggest the grain of the wooden floorboards more readily than they reveal a painterly language.

In every respect, these miniatures work against the natural properties of their medium, aspiring to effects that are more typical of oil paintings. Much like van Eyck's panel paintings, they seek to conceal the language of their description, relying on the fineness of brush-marks, the virtual blending of tones and descriptions of how light responds to different surfaces. It is not my intention to deny the existence of an interchange – in terms of style and composition – facilitated, no doubt, by artists who worked in both fields. There are also similarities between illuminations and small independent paintings in terms of image scale and the practices of viewing and using the images. What I should like to emphasise, however, is that these relationships were, in van Eyck's case, subservient to a much deeper fascination with the description of detail and how this relates to what the viewer is able to see. As I hope to have demonstrated, this was a central aspect of van Eyck's practice and should not be understood as a simple consequence of his early (probably limited) involvement with the painting of manuscript illuminations. Furthermore, the nature of van Eyck's descriptive language was quite foreign to the standard tempera technique and was very much part of what the oil medium allowed him to visualise and execute.

#### 4.4. Conclusion

Van Eyck's paintings, more than those of any of his contemporaries, always appear to describe more than the viewer is typically able to see. Some, mostly larger, paintings physically prevented viewers from looking closely enough to resolve all description. Other, mostly smaller, paintings contain details which require very close, considered viewing, some with the aid of a magnifying lens. Although van der Weyden's paintings contain some very finely painted passages, the fineness of his paintings is highly selective, varying considerably within the same work. In contrast, the overall fineness of van Eyck's paintings is extremely consistent. The idea that Rogier's paintings are finer than Jan's is therefore misleading and even inaccurate.

Eyckian paintings invite a dialogue with their viewers concerning the limits of what can be painted and what can be seen. His small-scale paintings especially recall the story from Pliny about Apelles and his ability to draw lines "visum effugientes" (escaping the eye).<sup>24</sup> As Pliny recounts, Apelles produced this 'invisible line' in a competition with another famous painter Protogenes. It seems quite plausible that both van Eyck and Rogier were aware of the story and that the notion of competitive painting appealed to their own practices.

Irrespective of whether van Eyck was familiar with Pliny's text, there are significant differences between these two artists which are not simply matters of 'fineness' but stem from fundamentally different ideas about the roles of detail and description. Although paintings by other artists (in particular van der Weyden) contain very finely painted details, description in van Eyck's paintings not only appears fine, it also appears to describe a higher resolution of observed detail than the viewer expects, based on ordinary visual experience. This high resolution is most apparent in their description of intricate or distant background forms and textures of foreground

surfaces. The descriptions of active, peopled landscapes or townscapes in the backgrounds of van Eyck's smaller paintings provide indications of how much detail the image resolves as increasingly distant forms are rendered with increasingly finer marks. His descriptions of surface textures invariably suggest that every surface is constructed from a kind of equivalence between the smallest visible constituent elements of surfaces (hairs, fibres, threads) and the marks that describe them. Occasionally this equivalence exists (Eve's hair on the *Ghent Altarpiece* for example), but most often the impression is an illusion which relies on a combination of invisible brush-marks, fine brush-marks which are visible but consistently suggestive of description, and an awareness of how this description might be perceived under particular conditions of viewing.

As plausible images, however, van Eyck's paintings are quite unlike actual visual experience in their approach to detail. Larger paintings such as the *Virgin and Child with the Canon van der Paele* (Fig 1.4) alter the expected relationship between scale and detail. Textures appear enhanced and the resolution of the image implies the viewer is closer to these surfaces than s/he actually is. In his smaller paintings, the treatment of brush-marks denies any kind of painterly language, making it difficult for viewers to distinguish where description begins and ends. In the finest passages of description, brush-marks occasionally imply a limit to the resolution of the image, much like the variation in focus or depth of field in a modern photograph, but the way in which these marks are themselves suggestive of description prevents the viewer from identifying this limit precisely. In other passages, in particular his smallest paintings, van Eyck appears to have used a magnifying lens to describe details beyond a point that can be resolved with the naked eye. The combination of these techniques produces images which apparently seek to deny their status as paintings, aspiring to

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<sup>24</sup> Pliny, *Historia Naturalis*, xxxv, 81-83.

the appearance of optically enhanced or generated images.

As well as using magnifying lenses as a practical aid, there are also suggestions that van Eyck's interest in mirrors might have informed his approach to seeing and describing detail. As I have suggested in the previous chapters, his involvement with lenses and mirrors was not primarily a practical one, but something more enduring and more complex. The way in which van Eyck's paintings depart from direct vision in seeking to alter the expected relationships between scale, detail, resolution and viewing distance bears a strong correspondence with how these same variables are altered in images produced by mirrors and lenses: whilst magnifying lenses enlarge detail at close distance, convex mirrors condense and miniaturise, producing images that seem more detailed – on account of their small scale – than unaided vision.

The illusion of detail in van Eyck's paintings is not simply an issue of style and technique, it is primarily an issue of how these aspects of his practice were informed by his interest in the properties of optical images. Whilst his paintings ultimately seek a direct relationship with real visual experience, this experience is also strongly suggestive of the altered and enhanced images of mirrors and lenses as well as vision itself.

## CONCLUSION

The principal aim of this thesis is to provide a more detailed and comprehensive definition of the optical concerns of van Eyck's practice than previous studies have attempted. At the core of the study, however, is the wider question of why van Eyck's paintings look so different to paintings by earlier and contemporary artists. Whilst previous studies have suggested a number of philosophical, socio-cultural, technical and stylistic explanations, my study argues primarily that his concern with optical images allowed him to translate aspects of visual experience – both intellectually and materially – in new ways.

The specific correspondences I have identified between the properties of images produced by lenses and mirrors and characteristics of van Eyck's paintings, I suggest, reflect a conscious engagement with translating their effects into painted equivalents. In the case of his smallest works, such as the Philadelphia *Saint Francis*, van Eyck appears to have used a lens as a visual aid in order to paint some of the finest details. His interest in optical devices was not, however, primarily practical but rather more conceptual. The way in which his paintings articulate mass and space in terms of luminance and translucency recalls a distinct property of how specular images are formed and read. In their approach to pictorial space, his paintings adopt an angle of view much wider than is possible in normal visual experience and employ distortions or 'enhancements' of curvature which reveal very distinctive spatial concerns most closely shared by convex mirror reflections. By manipulating the relationship between scale, viewing distance, and mark-making, Eyckian paintings also consistently construct the illusion of a limitless resolution of detail which often appears hyper-real in comparison with how textures and surfaces are normally perceived in reality.



Central to the visual concerns of van Eyck's practice is a fascination with the expectations and restrictions of visual experience. His engagement with devices such as convex mirrors and magnifying lenses appears to have informed a consistent investigation into the possibilities of naturalistic painting. By replicating effects of distortion or enhancement, which are typical of certain optical devices, his paintings both alter and confirm typical or expected relationships between visual concepts such as image resolution, field of view, luminance and how these are perceived in reality. In doing so they establish relationships between the painted image, direct vision and concepts of distortion and enhancement.

In its wider context, my thesis contributes significantly to ongoing debates about the origin and nature of 'Eyckian naturalism' and the extent to which this is either an accurate or a useful concept. Following the historiographic model established by Vasari and van Mander (who suggests in his *Schilder-Boek* that Netherlandish painting begins with the van Eycks), scholarship continues to position van Eyck, along with his brother Hubert and Robert Campin, as a 'founder' of the new naturalistic mode of painting which apparently developed during the 1420s. Although most scholars are today critical of suggestions that stylistic changes happen so rapidly – or that single innovations, or even single artists, might be responsible for initiating such changes – there is still a tendency, as I mentioned at the beginning of the thesis, to view van Eyck's work in particular as a break with earlier painting. The fact that we still refer to paintings as 'Eyckian' and 'pre-Eyckian' (especially in technical literature) is indicative of this widespread notion that 'Eyckian painting' marked a significant departure from what had gone before.

This thesis suggests that the optical concerns of van Eyck's practice offered nothing less than a new approach to naturalistic painting. As I mentioned at the

beginning of the thesis, this view is generally upheld by scholars but rarely clarified. Counter to this view is also a tendency to emphasise stylistic or technical traditions which only partially explain the origin of Eyckian painting. In stylistic analyses, for example, it is standard practice to cite manuscript miniatures, especially examples by the Boucicaut Master, as precedents for van Eyck's interest in light. In technical literature it is common to assert the similarity between van Eyck's glazing technique and the materials and layer structure of earlier oil paintings (especially the Norwegian altar frontals). Of course van Eyck's paintings must be seen in the context of earlier as well as contemporary painting practices. The paucity of surviving pre-Eyckian panel paintings from northern Europe also presents a problem which should not be underestimated. I would argue, however, on the basis of the evidence presented here, that such similarities have been unduly stressed. Whilst Eyckian paintings were indeed part of a broad tradition of oil panel painting, their engagement with optical concepts and effects was entirely unprecedented.

One of the key arguments in this study is that many of van Eyck's innovations were neither strictly technical nor stylistic. His use of glazed paint, for example, was 'technically' no different to methods used by other earlier artists. The complex relationship his paintings establish between translucency and the perception of luminance in visual experience was, however, an innovation of van Eyck's. Similarly, the various ways in which Eyckian paintings find equivalence between painted marks and the illusion of description is not simply an aspect of 'style' but, more specifically, a consequence of van Eyck's understanding of the relationship between image resolution and painted 'detail'. Put simply, many of the concerns I have identified in van Eyck's paintings derive not primarily from how he used his materials, but how his experience with optical images informed the way he thought about them.

The optical character of van Eyck's paintings must also have carried substantial resonance in different devotional contexts. Most notably, in his Marian works – which make up the majority of his 'nonportraits' – the visual and material concerns of the panels reinforce and activate the optical and specular focus of their 'symbolic' content. As I suggested in Chapter I, the fluid relationship between description and meaning is most fully resolved in the optical focus of van Eyck's Marian iconography, which is charged and activated by the optical character of the panel's themselves. This poses important questions about how the visual concerns of van Eyck's practice influenced the symbolic character of his paintings: whereas we tend to view aspects of style and technique as a vehicle for the 'meaning' of paintings, the evidence presented here points to a far more sophisticated relationship between the individual character of the artist's 'style', and his choice of particular motifs.

More generally, my argument has important implications for continuing research on the connection between early Netherlandish painting and devotional concepts of vision – a major theme in current scholarship. The recent study by Bret Rothstein,<sup>1</sup> for example, emphasises how panel paintings in this period encourage the viewer to turn away from sensory experience toward the idea of imageless understanding. At the core of his argument is a belief that paintings by van Eyck and his contemporaries point out the limits of painterly representation and, in doing so, emphasise the "spiritual utility of interpretive skill".<sup>2</sup> Looking at the reflection of the artist in St. George's shield on the *van der Paele Virgin*, an 'intelligent' viewer, he argues, would have recognised the artifice of the painted image, reiterating its status as a manufactured, two-dimensional surface.<sup>3</sup> The evidence presented in my thesis,

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<sup>1</sup> Rothstein, 2005.

<sup>2</sup> Rothstein, 2005: 80.

<sup>3</sup> Rothstein, 2005: 76.

however, suggests that precisely the opposite was the case. Certainly, van Eyck's paintings encourage a dialogue with their viewers about the nature of vision and image-making: they deter viewers from verifying their status as painted images in terms of their descriptive language; and they actively prevent symbolic ideas being separated from the representational and material concerns of the image. In every sense, they appear to have been designed for prolonged contemplative looking. Moreover, van Eyck's paintings reveal an extensive investigation into how vision works and how painted images might replicate or enhance comparable experiences and sensations. In doing so, they also aspire to a status of 'dematerialised' images, generated as much by light and the process of looking as by the artist's own hand. This clearly reveals an artist more concerned with the possibilities of painting than with its limitations.

In defining the optical concerns of van Eyck's practice, I hope to have deepened understanding of exactly what constitutes Eyckian painting generally. I have argued that van Eyck's paintings were unique in the context of earlier and contemporary work. An equally important issue, which is outside the scope of this study, is the extent to which an Eyckian mode of painting continued after van Eyck's death.<sup>4</sup> In other words, to what extent did the concerns of van Eyck's practice form the foundation for a new way of painting?

I would suggest that Eyckian painting was something of a short-lived, if not isolated phenomenon. Although van Eyck employed workshop assistants,<sup>5</sup> it is not known whether any of these were actually trained to paint by van Eyck or simply employed to carry out specific tasks. Certainly, there is no evidence that assistants

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<sup>4</sup> I intend to pursue this question in due course.

<sup>5</sup> He was paid wages at The Hague from 1422-25 for himself and an assistant, and in 1424, he acquired a second assistant. An unspecified number of 'Cnapen' and 'varlets' are mentioned in his workshop from 1432-33. Weale, 1908: xxxviii-xxxix. On van Eyck's workshop, see Bruyn, 1957.

ever worked any authenticated works by van Eyck. Moreover, on the basis of surviving paintings, no artist appears to have fully understood the nature of Eyckian representation. As studies have shown, van Eyck's shop appears to have continued after his death,<sup>6</sup> but his followers were unable to produce work of a comparable quality. A number of his followers copied compositions either directly from existing paintings or from workshop drawings which originated in his workshop.<sup>7</sup> In other cases, artists – such as Petrus Christus – seem to have used a simplified version of van Eyck's technique.<sup>8</sup> What most of these later paintings seem to lack, however, is not so much technical knowledge, or even painterly skill, but sufficient understanding of the concepts from which Eyckian paintings derive their unique optical character. This thesis provides a useful framework for assessing not just formal comparisons between van Eyck and later 'Eyckian painters', but also the dissemination of Eyckian painting as an ideology.

Whilst I do not underestimate the importance of looking at van Eyck's paintings through the eyes of an "intelligent" fifteenth-century viewer, I hope to have demonstrated the value of considering also how his own visual concerns as an artist relate to wider contexts of their display and use. His work has much to say about cultural and religious life in the fifteenth century, but arguably more to say about the practice of painting.

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<sup>6</sup> Ainsworth, 1994 and Jones, 2000.

<sup>7</sup> Jones, 2000.

<sup>8</sup> See, for example, Belting and Eichberger, 1983 and Buck, 1995 for discussions of Petrus Christus's understanding of van Eyck's technique.

APPENDIX 1

**Comparative Scales of the Subjects in Independent Portrait Panels\* by Jan van Eyck, Rogier van der Weyden and Robert Campin**

The table shows the dimensions of each panel (excluding the frames) and the height of the subject's head in each painting. Measurements were taken from 1:1 images. (Where the top of the head is obscured by headwear an estimate was calculated using the folds in the material as a guide).

Artist	Painting	Panel Dimensions (cm)	Height of Head (cm)	Average Height of Head (cm)
<i>Jan van Eyck</i>	Boudin de Lannoy	26 x 19.5	9.4	
	Man with a Ring	Originally 19.1 x 13.2 (now 22.5 x 16.6)	9.5	
	Man in Red Chaperon	25.7 x 19	9.9	
	Arnolfini	29 x 20	10.1	
	Jan de Leeuw	24.4 x 19.3	10.1	
	Tymotheos	33.2 x 19	10.1	
	Margaret van Eyck	32.6 x 25.8	12.3	
	Albergati(?)	32.5 x 25.5	15.7	
		(av = 24.6 x 17.8)		<b>10.9</b>
<b>Rogier van der Weyden</b>	Lady (Washington)	37 x 27	14.1	

\* Including those which may have originally formed part of a diptych.

	Francesco d'Este	29.8 x 20.4	14.1	
	Philippe de Croÿ	49 x 30	15.5	
	Anthony of Burgundy	38.4 x 28	15.8	
	Charles the Bold	50.9 x 33.6	15.9	
	Young Woman (Berlin)	47 x 32	16.3	
	Jean Gros	38.5 x 28.6	16.8	
	Man (Thyssen-Bornemisza)	32 x 22.8	17.7	
	Laurent Froiment	51.1 x 33.2	18.3	
		(av = 41.5 x 28.4)		<b>16.1</b>
<i>Robert Campin</i>	Stout Man (Madrid)	29.5 x 18	20.5	
	Man in Red Chaperon	40.6 x 28.1	22.3	
	Woman (London)	40.7 x 28.1	17.7	
		(av = 36.9 x 24.7)		<b>20.2</b>

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