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**From the ground up: Surface and sub-surface effects in fifteenth- and sixteenth-century Netherlandish paintings**

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## SUMMARY

From the Ground Up:  
Surface and sub-surface effects in fifteenth- and sixteenth-century Netherlandish paintings

*Abbie Vandivere*

This doctoral dissertation explores the techniques that were used to build up fifteenth- and sixteenth-century Netherlandish oil paintings, *from the ground up*. Paintings are more than two-dimensional images; they are physical objects composed of several layers, usually: the support, ground, underdrawing, (sometimes) an intermediate layer, paint, and varnish. Frequently, the paint itself is built up in several layers, and this often includes opaque underlayers overlaid with translucent glazes. This dissertation describes how each layer can have a visible effect on a painting's final appearance when an artist exploits the properties of the oil binding medium.

The research was conducted as part of the interdisciplinary project *The Impact of Oil: A history of oil painting in the Low Countries and its consequences for the visual arts, 1350-1550* ([www.impactofoil.org](http://www.impactofoil.org)). The overall aim of the Impact of Oil project was to document the history of the introduction, dissemination and development of the use of oil media in panel painting from 1350 to 1550. The *Impact of Oil* team was composed of specialists in different art historical and material-technical fields, with PhD students as investigators. Between 2007 and 2012, they were given the opportunity to visit major museums and institutions all over Europe and examine their early Netherlandish paintings using basic non-destructive methods like: infrared reflectography, x-rays, microscopy and digital (macro) photography. The team began with a list of key paintings for examination, but each member was able to focus on unique

aspects or individual paintings that contributed to their specific research interest. The project considered three types of sources when writing the history of oil painting: written sources on the production and the reception of oil painting, iconographical sources, and material sources. Within the scope of the *Impact of Oil* project, Abbie Vandivere focused on the material aspects of early Netherlandish paintings: the works of art themselves and their physical and technical properties.

*From the Ground Up: Surface and sub-surface effects in fifteenth- and sixteenth-century Netherlandish paintings* consists of an introductory chapter, six articles, and a conclusion. The articles, written between 2008 and 2012, are not intended to be an exhaustive review of how each part of a painting's structure was influenced by the use of the oil medium; rather, each article focuses on specific aspects of the layer structure and how they contribute to the visual effect of a painting. Some of these papers have been published in peer-reviewed journals or the pre- or postprints of symposia and conferences; others appear here for the first time. An attached CD-ROM contains the appendices: four related articles, a poster, and descriptions of the reconstructions.

The introduction presents the aims of the *Impact of Oil* project and Vandivere's research focus. It explains the technical examination methods that were used, and the ways that reconstructions were incorporated into her research. The composition and visual function of each layer of a painting's structure

are explained using the build-up of traditional (fifteenth-century Flemish) paintings as a foundation. Most early Netherlandish paintings were built up in a similar way, using a series of layers applied according to an established craft tradition. The panel provided a stable support onto which the ground was applied. The artist sketched or transferred a composition onto the ground, and this underdrawing was (sometimes) followed by an intermediate layer. Once it was dry, the paint was applied, usually built up in several layers. Afterwards, varnish could have been used to saturate the colours and protect the surface. The properties of the oil medium used to bind the paint – its translucency, fluidity and slow drying, blending capabilities and ability to create textural effects – are described at the end of the introduction.

“Cloeck en veerdigh: Energetic and skillful painting techniques of the sixteenth-century Leiden School” (Article 1) describes the innovative aspects of the techniques of painters active in Leiden in the early sixteenth century, in relation to the more traditional layer structure described in the introduction. Although artists like Cornelis Engebrechtsz (Leiden 1462–1527) and Lucas van Leyden (Leiden 1494–1533) often built up areas of colour in a traditional way, in some cases they appear to have intentionally modified earlier painting techniques. In the workshop, their innovations were transmitted from master to pupil and may have inspired other artists in the region. The technical features described in Article 1 are: the visibility of underdrawing, the use of isolation layers and underlayers, unconventional sequences used to apply paint layers, surface effects, and the creation of a wide range of tones (especially blues) with a limited number of pigments. Representations of fabrics, draperies, and clothing were examined to gain insight into artists’ materials and methods of modelling in different colours. The way these artists exploited the properties of the oil medium through layering and blending was also considered. Other technical articles about the Leiden School and related reconstructions are included as Appendices 1a, 1b, 4b and 4e on the attached CD-ROM.

The next two articles (2.1 and 2.2) focus on the function and appearance of intermediate layers in early Netherlandish paintings. Vandivere defines an intermediate layer as a (semi-) translucent layer of a single tone, which is comprised of a binding medium (usually oil) and, in some cases, pigments. It is applied over the entire surface of the ground, usually after the underdrawing, but before the rest of the paint layers. Intermediate layers were not used systematically in all early Netherlandish paintings, but were applied by some painters active in the Southern Netherlands,

and in the North around Haarlem. Different colours of intermediate layers that had a visual effect – white, grey and flesh-coloured – have been identified and analysed. “Reconstructing intermediate layers in early Netherlandish paintings” (Article 2.1) combines literature and source research, results from technical examinations, and reconstructions made with historically appropriate materials. Reconstructions were vital in explaining how intermediate layers helped to isolate the ground, fix the underdrawing, leave the underdrawing (partially) visible, and act as a base tone. They are described and illustrated within the article, and are supplemented by the work logs in Appendix 4c. An additional article and poster about intermediate layers are included as Appendices 2b and 2c.

A specific type of flesh-coloured intermediate layer is the *primuersel*, described by Karel van Mander in the *Schilder-boeck* (1604). Van Mander mentioned Hieronymus Bosch (’s-Hertogenbosch 1450–1516) as one of the artists who exploited its visual possibilities. “A translucent flesh-coloured *primuersel*’: Intermediate layers and visible underdrawing in Hieronymus Bosch’s paintings” (Article 2.2) is an unpublished paper about his purported use of the *primuersel*. There are certain paintings by Bosch that seem to exploit its effects: for example, the *Pedlar* (ca. 1500, Museum Boijmans van Beuningen, Rotterdam) and *Scenes from the Passion of Christ and the Pelican with her Young* (ca. 1504–1505, Gemäldegalerie, Berlin). However, for his oeuvre as a whole, the picture is more complicated. Article 2.2 incorporates observations from technical examinations conducted by Vandivere and results from technical literature, particularly the 2001 survey of Bosch’s paintings at the Museo del Prado, Madrid. In addition to describing Bosch’s intermediate layers and using the Rotterdam and Berlin paintings as case studies, this paper also addresses the question of why his underdrawing is often visible to the naked eye, and whether it could have been an intentional effect.

Moving through the upper layers of the painting’s structure, the next section of the dissertation focuses on surface effects. Examples where Jan van Eyck (Maaseik 1395 – Bruges 1441) scraped into wet paint, blotted his glazes and used his hands or fingers to manipulate the paint are discussed in “Surface effects in paintings by Jan van Eyck” (Article 3.1). The appearance of Van Eyck’s small paintings has been described as jewel-like, enamel-like, sparkling and glowing, with a flawless surface. Many of his larger works contain surface effects that enhance or disrupt this perfect illusion. It seems that the need to apply paint smoothly over a large area required that he adjust his painting technique to include methods like blotting glazes and

manipulating the paint with his hands or fingers. He also used other tools to manipulate the surface of the wet paint: a brush to blend one colour into another, and a blunt instrument to scrape into the paint. These surface effects were made possible – and sometimes made necessary – by the oil binding medium that Van Eyck used. Modifications to the medium sometimes caused handling problems, and solutions to these problems created visible surface effects. The first part of Article 3.1 introduces the rheology of the types of oils that Van Eyck used. Afterwards, it focuses on the various ways that Van Eyck manipulated his paint, and the effects that have been observed in his oeuvre. Surface effects in the *Virgin and Child with Canon van der Paele* (1436, Groeningemuseum, Bruges) and the *Ghent Altarpiece* (1432, Saint Bavo's Cathedral, Ghent) are described and illustrated in detail. In some cases, surface effects reveal steps in Van Eyck's working process, his materials, and the handling properties of his paint.

The unpublished paper that follows – “Surface effects in the context of early Netherlandish painting” (Article 3.2) – places Jan Van Eyck's techniques within a larger context, and includes a discussion of the Pre-Eyckian painters who preceded him. Examples of scraping were found in Pre-Eyckian painting, but other surface effects like blotting and fingerprints are absent, which suggests an “Eyckian turning point.” As artists around the time of Van Eyck used glazes more regularly and over larger areas, the need for blotting arose. Another turning point is related to the realistic depiction of surface texture in fabrics. Some surface effects, like scraping and applying impasted dabs of paint, contribute to the realistic depiction of fabrics by suggesting their identity or texture. Sophisticated surface effects were used by Van Eyck's contemporaries, including Rogier van der Weyden (Tournai 1399/1400 – Brussels 1464), and Stefan Lochner (Meersburg 1400 – Cologne 1452). One of his Northern Netherlandish followers, Geertgen tot Sint Jans (Leiden ca. 1465 – Haarlem ca. 1495), employed surface effects like scraping extensively in his paintings, specifically to create texture in fabrics.

A specific type of textile that employs the blending or layering capabilities of the oil medium is the depiction of changeant. This shot silk changes colour depending on the angle of the viewer's eye to the surface of a given part of the fabric. “Changing drapery, recipes and practice” (Article 3.3) combines source research by Mark Clarke (technical art historian and fellow member of the *Impact of Oil* project) with Vandivere's technical research, examples from fifteenth- and sixteenth-century paintings, and reconstructions. It shows that the depiction of

changeant in paintings often followed a system of formulaic modelling that was described in medieval manuscripts, but that certain artists adapted and refined this system to render more convincing draperies. Appendix 3a is another article by Clarke and Vandivere about changeant, and reconstructions are described in Appendix 4e.

A conclusion, bibliography and acknowledgments follow the articles. The enclosed CD-ROM includes the appendices: four articles, a poster, and reconstructions related to the aforementioned topics. Making reconstructions was an important part of Vandivere's research into the visual effect of layers beneath a painting's surface. They allowed her to gain hands-on experience with binding media and pigments that were mentioned in the literature and historical recipes. The concept of “historical accuracy” is discussed in Appendix 4a, and Appendices 4b-4e include work logs and photographs of the reconstructions that she made.