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STILL LIFE WITH GRAPES AND NEST

The article describes the examination and conservation process of a panel painting which had ended up in private ownership in Estonia. These processes revealed an artwork of an unexpectedly high level of mastery hidden beneath layers of overpaint. Furthermore, it made for an intriguing back story for the painting, as well as expanding our arsenal of investigation methods.

The small panel painting (49 × 41 cm) of a barely visible image (Fig. 1) was given to conservators with the aim of revealing the original layers of the painting that had been extensively restored at some point and, with the help of the simplest possible (optimal) methods, to find an answer to the question in which spatial and value contexts the painting could be placed. It is a classical still life with traditional elements: grapes and other fruit in a basket, a walnut, a bird's nest with eggs, a little feather. The painting was sold at an internet auction as a work by Jan Davidsz Dé Heem (1606–1684) but there was every reason to doubt its provenance, which is unknown.

Although a few still lifes are known from Classical Antiquity, the genre actually came into its own with the rising popularity of optical illusion in the 14th century. The 17th century is considered the golden age of still life with the Dutch and Flemish painters excelling in the refined rendering of tactile qualities of objects. The



FIG. 1. PAINTING BEFORE CONSERVATION. PHOTO: ANDRES UUENI.

demand for these oil paintings and the emerging art market led to the creation of hundreds of still lifes to decorate both the walls of grand palaces and modest artisans' homes. The seemingly simple still lifes depicted an abundance of fruit, flowers, vegetables, fish, game, poultry, tableware, etc. Painters aimed at depicting three-dimensional objects on a flat surface to such a degree of realism that the viewers would not be able to tell the difference. However, still

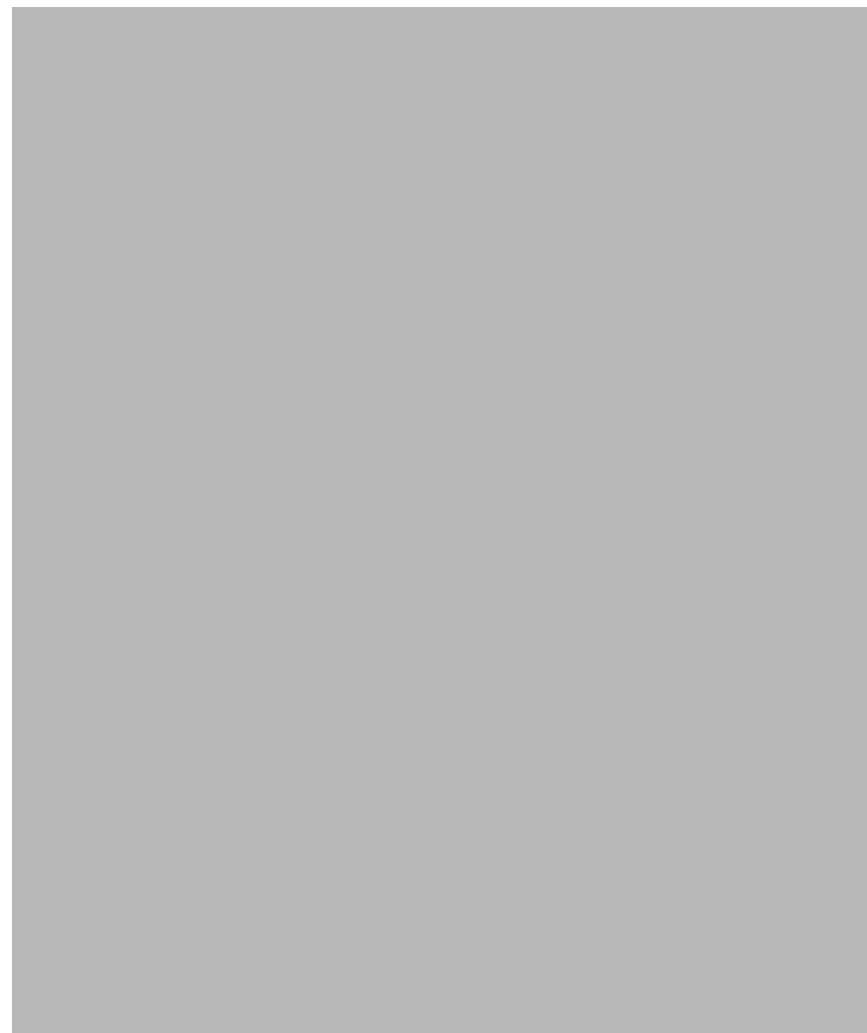


FIG. 2. PAINTING AFTER CONSERVATION. PHOTO: ANDRES UUENI.

lifes could and usually did express deeper symbolic and allegorical meanings as well.

The genre became popular all over Europe and even in the 17th-century inventories of the merchants and artisans of Tallinn, still lifes are mentioned. The ever growing popularity of the still lifes of the Dutch Golden Age led to a proliferation of copies and new paintings in the style of the Dutch and Flemish masters in the 19th



FIG. 3. BACK OF THE PAINTING. PHOTO: ANDRES UUENI.

century, both in Europe and in America. This trend has continued ever since and the 20th century added the mechanical and later digital reproductions to this mass of paintings.

Therefore, a still life depicting grapes and other fruit in a basket and a bird's nest with three eggs in the manner of Dutch 17th-century paintings, could actually date from the 19th or 20th century and originate from anywhere from Russia to the USA.

A first glance at the back of the panel, composed of narrow parquet-strip like slats, gave no reason to expect that the painting should represent an early painting tradition (Fig. 3). However, a closer examination made it clear that the painting had undergone an extensive, skilful and expensive, but still brutal previous conservation. There must have been good reasons for this kind of treatment and this made us pay more attention to the painting.

EARLIER CONSERVATION TREATMENT

The back of the painting that had first looked like a structure of narrow strips, turned out to be an oak panel of two joint planks. Most probably the painting had been badly warped and the conservator tried to mechanically straighten it. Grooves were cut into the wooden surface to help to straighten it. The resulting cracks were later filled with perfectly fitting wooden pieces and the whole back of the panel was supported with crossbars – or at least that's how we can imagine the process. The painting has also been disassembled along its original joint line of planks and it has been cut narrower by a couple of millimetres. It is visible on the front where a visual shift develops in the composition of the junction of the paint layer. We do not know whether the panel was thinned in the course of this complex process but the panel is extraordinarily thin. If the usual thickness of wooden panels is 8–30 mm, then the panel of this painting is just ca 4–5 mm.

This rather drastic straightening method had also led to some cracks on the front. However, it is surprising how little the process had damaged the paint layer and thus provides us with an indication of an excellent quality of painting technique.

It is likely that the paint layer had been cleaned with historically traditional, strong solvents which caused the fragmentation or total loss of the background paint. On the other hand, the much more impasto technique modelled paint layer had survived almost undamaged under the thick layers of overpaintings. It looks as if after cleaning, the damaged surface had been covered in a thick layer of varnish with shots of pigment of variable amounts and colour applied here and there. The use of coloured glazes was most probably aimed at harmonizing the painting after cleaning, hiding the damage and also providing the painting with an authentic period look (the

so-called gallery tone). However, these observations do not enable us to determine the time of conservation, whether it took place in the 18th, 19th or the 20th century.

INVESTIGATIONS CONDUCTED

First, the basic element analysis was carried out in order to find out fast and nondestructively, whether the contents of the applied pigments could be associated with a certain era. Mostly these are the pigments that were invented and used by artists during the 19th century and their identification might rule out the paintings dating from earlier eras. Pigments were tested by X-ray fluorescence (XRF) screening but the results gave no identification of any 19th century synthetic pigments being applied. However, this does not rule out a completion date later than the 17th century, as the earlier palette of pigment remained in use at the same time as more recent innovations.

MULTISPECTRAL ANALYSIS

Investigation continued with multispectral (MS) analysis, one of the most widely used methods in the examination of cultural heritage. This complex method is used in various spheres: for the study of landscapes, archaeological excavation sites, paintings and artefacts. Thanks to the availability of digital solutions, various solutions have been suggested in recent decades for rendering MS analyses.

Although a spectre gained in the course of an MS analysis can be fairly limited, the volume of the information received can be large and important, depending on a specific need or a technical solution. A high resolution quality image with a sufficient depth of field is essential for the analysis. The examined still life was photographed with an infrared camera at 820 nm wavelength which may give a hint about a possible underpainting or another painting under the visible layer of paint. No information was gained of either. The so-called Infrared False Colour (IRFC) image turned out to be much more interesting, although in general it is not considered to be an informative means of examining paintings.

In order to understand the IRFC, the Real Colour Concept is significant – an image is called a picture of real colour when it provides a natural transfer of colour. This means that the colours of

the object depicted in the picture are presented to an observer in a similar way to how people might directly see them.

False colour indicates the group of methods for rendering colours that is used for displaying coloured images, registering the electromagnetic spectre in visible and invisible parts. In the case of IRFC, the colours are shifted and one colour channel could be the electromagnetic radiance, in this case IR, outside the spectre visible to the human eye.¹

There are several methods of making an IRFC image, technical solutions can be adjusted according to specific needs: e.g. pictures are taken in four wavebands of the spectre: in three spectre areas visible to human eye (red 550–650 nm (R), green 450–550 nm (G) and blue 400–450 nm (B)) and in one waveband invisible to human eye, e.g. in infrared (> 700nm).²

Excluding the blue waveband is a popular method, whereas blue gets replaced by green, green by red and red by an infrared waveband.³ The result is a false colour image that may in some cases identify transitions in darker areas in a more detailed manner, the earlier retouchings and carry out primary identification of pigments and binders.⁴ In comparison with the more accurate but much more time-consuming infrared photography, IRFC is notably faster and in some cases, more informative as well.

This time the IRFC turned out to be interesting from the point of view of conservation, as it gave the first idea of the state of the original painting. Under the thick layer of overpainting glaze, massive

1 Jay Arre Toque, Yuji Sakatoku, Ari Ide-Ektessabi, "Pigment identification by analytical imaging using multispectral images", *Proceedings of the International Conference on Image Processing* (2009), art. no. 5414508, 2861–2864.

2 Emanuele Salerno, Anna Tonazzini, Emanuela Grifoni, G. Lorenzetti, Stefano Legnaioli, Marco Lezzerini, Luciano Marras, Stefano Pagnotta, Vincenzo Palleschi, "Analysis of multispectral images in cultural heritage and archaeology", *Journal of Laser and Applied Spectroscopy*, 1 (2014), 22–27.

3 Paola Ricciardi, John K. Delaney, Lisha Glinsman, Mathieu Houry, Michelle Facini, René de la Rie, "Use of visible and infrared reflectance and luminescence imaging spectroscopy to study illuminated manuscripts: Pigment identification and visualization of underdrawings", *Proceedings of SPIE* (2009), 7391, art. no. 739106.

4 Antonino Cosentino, "Effects of Different Binders on Technical Photography and Infrared Reflectography of 54 Historical Pigments", *International Journal of Conservation Science*, 6 (3) (2015), 287–298; Marcello Melis, Matteo Miccoli, Donato Quarta, "Multispectral Hypercolorimetry and automatic guided pigment identification: Some masterpieces case studies", *Proceedings of SPIE* (2013), 8790, art. no. 87900W.



FIG. 4. INFRARED FALSE COLOUR PHOTO. PHOTO: ANDRES UUENI.

damage and losses in the background paint became clearly apparent (Fig. 4).

When it turned out that no abnormal chemical elements had been used in the painting, that the surface of the painting was probably the result of an extended conservation and that the wooden panel was made up of two glued oak planks, it was clear that further information



FIG. 5. VIEW FROM THE LOWER EDGE OF THE PAINTING PANEL STILL LIFE WITH GRAPES AND NEST. TWO OAK BOARDS ARE GLUED TOGETHER FROM THEIR BARK-SIDE EDGES. PHOTO: ANDRES UUENI.

could be gained from dendrochronology by determining the age of the panel with the help of the tree rings. For various reasons, however, dendrochronology is not always able to provide a date.

DENDROCHRONOLOGICAL INVESTIGATION

The two vertical oak planks were glued together on their bark-side edges (Fig. 5). It is noteworthy that in the right plank rays are more or less parallel with the plank, while in the left plank, rays rather run diagonally. We did not notice any lighter sapwood in the bark-side ends of the planks.

As the top end of the panel was damaged in the right corner, we focused on the lower edge of the panel. The edge was carefully cut with razor blades, to make tree rings better visible. The widths of tree rings were measured, using an Eschenbach 115410 precision scale hand lens with 10x magnification. The ring width series were analysed in the TSAP-Win program.⁵ Later, the edges of the panel boards were macro-photographed⁶ and the tree-ring widths from the photos were re-measured, using the CooRecorder/CDendro program.⁷ Repeated measuring was carried out because of poorly

⁵ Rinntech, *Technology for tree and wood analysis*, <http://www.rinntech.de/index-28703> [accessed 13.02.2020].

⁶ Samuli Helama, Alar Läänelaid, Maija Santala, Ari Tanhuanpää, “Dendrochronological dating of wooden artifacts by measuring the tree rings using magnifying glass and photography assisted method: an example of a Dutch panel painting”, *Archaeological and Anthropological Sciences*, 8 (2016), 161–167, <https://doi.org/10.1007/s12520-014-0222-3> [accessed 13.02.2020].

⁷ Cybis Elektronik & Data AB, *CooRecorder and CDendro programs*, <http://www.cybis.se/forfun/dendro/> [accessed 13.02.2020].



FIG. 6. INCREMENT SERIES OF TWO PAINTING BOARDS OF STILL LIFE WITH GRAPES AND NEST SYNCHRONISED AT A RELATIVE TIME SCALE; OVERLAP 127 YEARS, TBP = 7.8, GLK = 67%.

distinguishable ring borders. Correct measurement of the tree rings was accomplished by inconsistencies in ring segments on two sides of a ray.⁸ 138 tree rings were measured in the left board and 127 rings in the right board. Besides, both boards had a part of next tree ring on the outer end of the plank. All the tree-ring series of the boards were compared with each other by graphs and similarity indices in TSAP-Win. Among the similarity indices, t-value of Baillie-Pilcher (TBP)⁹ and *Gleichläufigkeit* (GLK)¹⁰ were considered as the most important ones. The tree-ring series of the two boards were very similar to each other in the position where there was a difference of one year between the latest ends of the series (Fig. 6). Then the tree-ring series of the oak boards and the averaged series of the two boards were synchronized with oak reference chronologies over Europe.¹¹

8 The difficulties in measuring tree rings in thin oak planks were described in detail by Māris Zunde (Māris Zunde, “The Use of Baltic Oak for the Panels of Paintings by Dutch and Flemish Old Masters: The First Attempt at Dendrochronological Identification in Latvia”, *Baltijas ozoli / Baltic oaks*, ed. by Laura Okdaldere (Riga: Latvian National Museum of Art, 2019), 53–87).

9 Mike G.L. Baillie, Jonathan R. Pilcher, “A simple cross-dating program for tree-ring research”, *Tree-Ring Bulletin*, 33 (1973), 7–14.

10 Dieter Eckstein, Josef Bauch, “Beitrag zur Rationalisierung eines dendrochronologischen Verfahrens und zur Analyse seiner Aussagesicherheit”, *Forstwissenschaftliches Centralblatt*, 88 (1969), 230–250, <https://doi.org/10.1007/BF02741777> [accessed 13.02.2020].

11 The International Tree-Ring Data Bank, <https://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/tree-ring> [accessed 13.02.2020].



FIG. 7. AVERAGE TREE-RING WIDTH SERIES OF PAINTING PANEL STILL LIFE WITH GRAPES AND NEST (1EQVIN02) CROSS-DATED AGAINST SOUTH AND CENTRAL GERMAN IMPORT OAK CHRONOLOGY (3NQSCG01); OVERLAP 138 YEARS, TBP = 4.9, GLK = 67%, DENDRO-DATE AD 1626.

Comparing the average ring-width series of the panel *1eqvin02* with dozens of oak chronologies over Europe, there was not much similarity. Comparison with another oak chronology, South and Central German oak imports to the Netherlands (AD 1360–1837)¹² was more successful. We synchronized our panel series with this chronology (denoted as *3NQSCG01*) and found one similar position (Fig. 7). In this position the two tree ring series overlap 138 years and the last tree ring of the panel series corresponds to AD 1626. As there is one partial unmeasured ring in the end of series, the actual dendrochronological date of the panel is AD 1627.

Although the ring width series of the two planks of the painting panel were quite similar to each other (TBP = 7.8), the left plank distinguishes itself by its diagonal rays and narrower tree rings. Generally, planks with non-parallel rays (semi-radial planks) are considered to be of lower quality for painting panels.¹³ Alongside, the left plank contains more tree rings (138) than the right plank (127), with average ring widths 1.32 mm and 1.54 mm, respectively.

12 Esther Jansma, Elsemiek Hanraets, Tamara Vernimmen, “Tree-ring research on Dutch and Flemish art and furniture”, *Tree Rings in Archaeology, Climatology and Ecology*, 2. Proceedings of the Dendrosymposium 2003, ed. by Esther Jansma, Achim Bräuning, Holger Gärtner, Gerhard Schleser, Schriften des Forschungszentrum Jülich, Reihe Umwelt, 44 (Jülich, 2004), 139–146.

13 Pascale Fraiture, Hélène Dubois, “Dendrochronological and technological examination of painting supports. The case of Rubens’s studio practice”, *Tree Rings, Art, Archaeology*. Proceedings of an international conference. Brussels, Royal Institute for Cultural Heritage 10–12 February 2010, ed. by Pascale Fraiture (Brussels: Brepols, 2011), 313–329.

It cannot be confirmed conclusively that the planks for this panel were cut from the same tree trunk.

According to our observations there were no sapwood remains in the studied boards. Therefore, missing sapwood ring numbers can be added to AD 1627 to increase the precision of the dating. The oak sapwood amount varies geographically and has been widely investigated on modern trees from different regions of Europe.¹⁴ In Germany, as the origin of the reference chronology in this case, the number of oak sapwood rings ranges from 8.22 to 37.95 within 95% confidence limits (absolute range 7–66 with 19 as an average).¹⁵ Moreover, it is known that the wood for panel paintings was seasoned for two to eight years before use in the 16th and 17th centuries.¹⁶ Hence, based on these assumptions, the date AD 1627 of the panel under investigation can be extended by at least 10 years, i.e. the minimum sapwood amount of eight years plus minimal seasoning of two years, in other words, AD 1637 *terminus post quem*.

As the wood for the panel of the *Still Life with Grapes and Nest* is evidently of German origin, alternatively the German terms of sapwood width and seasoning of the wood, as defined by Esther Jansma and others can be applied.¹⁷ According to them, the minimum number of missing sapwood rings is 20 and the aging period of the wood is 4 years. Thus at least 24 years have to be added to the dendrochronological date of the German-origin panel: 1627 + 24 = 1651 *terminus post quem*.

When interpreting the date of the painted panel it is important to know that the so-called Baltic timber was used for panel making

14 Kristof Haneca, Katarina Čufar, Hans Beeckman, “Oaks, tree-rings and wooden cultural heritage: a review of the main characteristics and applications of oak dendrochronology in Europe”, *Journal of Archaeological Science*, 36 (2009), 1–11, <https://doi.org/10.1016/j.jas.2008.07.005> [accessed 13.02.2020]; Kristina Sohar, Adomas Vitas, Alar Läänelaid, “Sapwood estimates of pedunculate oak (*Quercus robur* L.) in eastern Baltic”, *Dendrochronologia*, 30 (2012), 49–56, <https://doi.org/10.1016/j.dendro.2011.08.001> [accessed 13.02.2020]; Kristina Sohar, *Oak dendrochronology and climatic signal in Finland and the Baltic States*. PhD thesis (Tartu: University of Tartu Press, 2013).

15 Ernst Hollstein, “Jahrringchronologische Datierung von Eichenhölzern ohne Waldkante”, *Bonner Jahrbücher*, 165 (1965), 12–27; Ernst Hollstein, *Mitteuropäische Eichenchronologie* (Mainz am Rhein: Verlag Phillipp von Zabern, 1980).

16 Josef Bauch, Dieter Eckstein, “Woodbiological investigations on panels of Rembrandt paintings”, *Wood Science and Technology*, 15 (1981), 251–263, <https://doi.org/10.1007/BF00350943> [accessed 13.02.2020].

17 Jansma, Hanraets, Vernimmen, “Tree-ring research on Dutch and Flemish art and furniture”, 139–146.

in the Netherlands until AD 1660. During ca 1600 – 1660 there was an overlap with German timber, while after AD 1660 only German sourced timber was used for panel paintings.¹⁸ As a rule, local or imported oak timber from Germany was of lower quality than the Baltic oak. This, in turn, was related to forest management.¹⁹ The change in the timber provenance depended on the British Navigation Acts of 1651 and 1660 which restricted Baltic trade by the Dutch.²⁰ As both versions of the date, AD 1637 *terminus post quem* and AD 1651 *terminus post quem*, fall into the transition period from Baltic timber to German timber, the German provenance of the panel timber is very likely. It may also explain the usage of a lower-quality semi-radial oak plank for this painting.

In conclusion, dendrochronological investigation of the panel showed that it was made of two vertical oak planks. The tree-ring series of 138+1 rings was dated to AD 1627. Taking into account the number of missing sapwood rings and minimal seasoning period of the wood, it means the earliest possible manufacturing year of the panel, according to different sapwood and seasoning estimates, is either AD 1637 *terminus post quem*²¹ or AD 1651 *terminus post quem*²². The oak wood of the panel apparently originates from Central or South Germany.

However, the dendrochronological date gives the probable date of the panel, not the painting itself. Nevertheless, it is unlikely that the manufactured panels were stored for long years before painting on them. Also, the infra-red investigation of this panel did not reveal any signs of possible re-use of the panel for a new painting.

18 Jansma, Hanraets, Vernimmen, “Tree-ring research on Dutch and Flemish art and furniture”, 139–146.

19 Hans Beeckman, “The impact of forest management on wood quality. The case of medieval oak”, *Constructing Wooden Images*. Proceedings of the Symposium on the organization of labour and working practices of Late Gothic carved altarpieces in the Low Countries, Brussels 25–26 October 2002, ed. by Carl Van de Velde, Hans Beeckman, Joris Van Acker, Frans Verhaeghe (Brussels: VUB Brussels University Press, 2005), 93–113.

20 Jansma, Hanraets, Vernimmen, “Tree-ring research on Dutch and Flemish art and furniture”, 139–146.

21 Hollstein, “Jahrringchronologische Datierung von Eichenhölzern ohne Waldkante”, 12–27; Hollstein, *Mitteuropäische Eichenchronologie*; Bauch, Eckstein, “Woodbiological investigations on panels of Rembrandt paintings”, 251–263.

22 Jansma, Hanraets, Vernimmen, “Tree-ring research on Dutch and Flemish art and furniture”, 139–146.

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SUMMARY

A complex conservation process revealed the layer of the painting in its original subtlety and delicate retouchings recreated the integral surface of the painting. As a result, we can confirm that it is a painting of high artistic quality dating most probably from the middle of the 17th century, painted on an oak panel of German origin. We remain doubtful about the Internet auction suggested authorship, as the painting does not reach the artistic quality of Jan Davidsz Dé Heem, a top rank artist from the Netherlands. It is possible to continue with the art-historical analysis (and other investigations) of the painting, to find further proof for the hypothetical dating and maybe even reach an attribution but we must not forget to ask the questions whether and to whom it would be necessary. What matters for the owner of the painting is the fact that an artwork which decorates the wall of his home has both aesthetic and historical value – even without knowing its exact date or the painter.

CV

Hilkka Hiiop, PhD (b. 1974) is a professor in the Department of Conservation at the Estonian Academy of Arts. She has studied and worked as a conservator in Berlin, Amsterdam and Rome, supervised a number of conservation and technical investigation projects in Estonia, curated exhibitions, and conducted scientific research on conservation and technical art history.

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