

Dating of a 17th Century Painting by Tree Rings of Baltic Oak

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Abstract

Tree rings of an oak (*Quercus robur* L.) panel with painting of the Dutch Hans van Essen, a 'Still life with a lobster', established the period of origin of that piece of art deposited in the Estonian Art Museum in Tallinn. The ring width sequence was compared with Baltic oak tree-ring chronologies by T. Wazny and J. Hillam and I. Tyers. These references gave the last annual ring of the painted panel to be from AD 1600. High similarity of the tree-ring series shows that the oak of the panel is of Baltic origin. The outermost rings of the oak tree, including the sapwood, have been cut off. The approximate number of sapwood rings of oaks is known. It points the probable painting time between AD 1617 and 1623. This dating fits into the life years of Hans van Essen (1587 or 1589 to 1642 or 1648).

Key words: annual rings, oak panel, H. van Essen, painting, 17th century, dendrochronological dating

Introduction

Dendrochronological dating of paintings is practiced in Western Europe since late 1960s (Eckstein 2005, Bauch 1978, Bauch and Eckstein 1970, 1981, Klein 1989). Thousands of painting panels and other wooden artworks have been dated by their tree rings since that time. Now a first attempt to date a Netherlandic piece of art was made in Estonia.

It was the oil painting of the Netherlandic painter Hans van Essen 'A still life with a lobster' deposited in the Estonian Art Museum (under M 5271, Fig. 1).

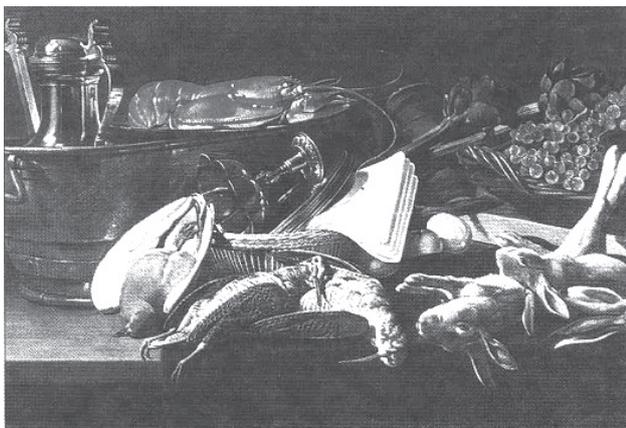


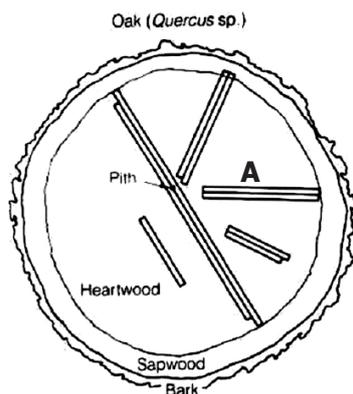
Figure 1. Black-and-white reproduction of the painting of Hans van Essen 'Still life with a lobster', painted with oil on two horizontal oak boards. The size of the painting is 60.8 x 91.8 cm.

It was painted on an oak (*Quercus robur* L.) panel, glued together from two boards to a size of 60.8 x 91.8 cm. The date of the painting was not known. The Estonian art historian Mai Levin has noted that this painting represents one of the few preserved and known (probably four) works of the Flemish painter H. van Essen. The painting deserves interest both for its quality of art and the development of the genre of still life. She assumed that 'Still life with a lobster' could have been painted in the 1620s (Levin 1982). Hans van Essen was born either in 1587 or 1589, he died in 1642 or 1648 (Thieme-Becker 1915, SAUR 1999).

Tree rings on the oak boards of the van essen painting

We surfaced a few millimetres wide edge at one end of both oak boards. By a binocular microscope (magnification 16x) the tree-ring widths were measured to the nearest 0.05 mm. The annual rings were often very narrow and hardly distinguishable. The series of the two boards matched each other very well, giving Student's $t = 15.27$ and the sign test or percentage of similar fluctuations (*Gleichläufigkeit*) $W = 77.5$ at a significance level of 99.9. Judging on the high similarity of the two ring width series, the two boards were apparently cut from one oak trunk. As the direction of the ends of the boards was radial, the location of the boards in the oak log could be as depicted in Figure 2. The tree-ring series of the two oak boards were averaged into one tree-ring series of 211 years.

Figure 2. Location of the ends of boards in an oak log. The two boards of the van Essen painting most probably come from the location A: extending along radial direction without sapwood and pith. After Klein 1998



It is very likely that the oak species is the pedunculate oak, *Quercus robur* L., although the possibility of sessile oak, *Quercus petraea* (Matt.) Liebl., cannot be excluded. According to F. H. Schweingruber, the timbers of these two oak species are anatomically undistinguishable (1993). There are some attempts made for distinguishing these oak species by wood anatomy and by identification of wood extractives (Feuillat *et al.* 1997, Mosedale *et al.* 1998), but these methods were not applicable in our case of artwork.

Dating of the tree-ring series

Nearly two decades ago, the Polish dendrochronologist Tomasz Wazny was the first to construct an oak chronology assembled from construction timber in Polish architectural monuments. Later, Jennifer Hillam and Ian Tyers in England composed a panel-painting chronology for Baltic oaks (Hillam and Tyers 1995). It produces a high similarity with the series of the van Essen painting: Student's $t = 8.76$, sign test $W = 67.6$ at the significance level of 99.9. The dendrochronological dating of the last tree ring in the panel of the van Essen painting turned out to be **AD 1600** (Fig. 3) (Läänelaid and Nurkse 2002).

This result for the H. van Essen painting was sent to a specialist of dendrochronology Sigrid Wrobel in the Institute for Wood Biology of the University of Hamburg. She checked and confirmed the dendrochronological dating. Moreover, since 1985 (Baillie *et al.* 1985, Eckstein *et al.* 1986, Klein 1989) it is definitely known that many oak boards used for paintings in Western Europe were imported from Poland or the Baltic region. T. Wazny checked the dating of Hans van Essen average series against several Polish oak chronologies and concluded that the region of origin of that oak lies somewhere in eastern or north-eastern of Poland (Wazny, personal comm.).

Time of painting of the still life by H. van Essen

Dendrochronological dating of the oak panels of painting by van Essen, AD 1600, does not mean the date of making the picture. It is only the year of the

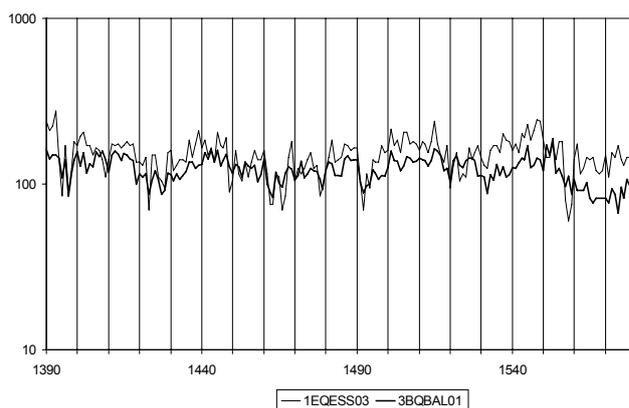


Figure 3. Tree-ring widths of the oak panels of H. van Essen 'Still life with a lobster' (thinner line) matched with the Baltic oak chronology 1. 1EQESS03 – average ring widths of the two boards of Hans van Essen painting, 3BQBAL01 – Baltic oak chronology 1 (Hillam and Tyers 1995). Abscissa – years, ordinate – ring widths in 0.01 mm

latest annual ring preserved in the board. In making boards for artworks, the less durable sapwood was usually removed, as it does not preserve as well as the darker heartwood in the inner oak trunk.

In the two oak boards of the painting of van Essen we did not find any sapwood at the edges of the boards. Sapwood and maybe some heartwood were cut off. Therefore we have to restore the probable number of tree rings which got lost during the production of the panel. It has been established that in Europe the number of sapwood rings of oaks varies from west to east (Eckstein *et al.* 1986, Wazny 1990). The average sapwood numbers have been investigated for oaks in Ireland, England, France, Germany, and Sweden (Hillam *et al.* 1987). For wood originating from Germany or the Netherlands, the median value was 17, with 50 % of all values lying between 13 and 23 (Klein 1998). In oaks growing in Poland the number of sapwood rings in the central 50 % was 13-19; the median value was 15, the minimum 9, and the maximum 36 tree rings. Presuming that the timber of panels of the van Essen painting came rather from Poland, we can apply these numbers to estimate the amount of missing sapwood rings. Thus we propose that the last annual ring under the bark (waney edge) of the oak for the van Essen painting has grown between 1609 and 1636; within the 50 % probability range the last growth year lies between 1613 and 1619, of them the most probable last year is 1615. The oak was cut and its trunk split into boards. The well known Baltic ports for timber export were Gdansk (Danzig) and Riga (Zunde 1998, 1999). From Gdansk (Danzig) much oak wood was exported to harbours of the Netherlands (Wazny and Eckstein 1987,

Wazny 2005). M. Zunde notes (*op. cit.*) that the summit of oak timber export from the port of Riga was in the first half of the seventeenth century. Another Baltic port, Tallinn (Reval), had minor importance in timber trade of that time. Taking into account that the oak has probably grown somewhere in eastern or north-eastern Poland, Gdansk or Riga can be considered the possible export harbours of this oak timber. We can assume that the timber reached Amsterdam, where the painter Hans van Essen worked.

According to Bauch, Eckstein and Brauner (1978), the interval between the felling of an oak and the creation of a painting in the 16th and 17th centuries has been approximately two to eight years. In the case of the van Essen painting it means that the painting could have been created between 1611 and 1644. Taking 15 years as the most probable number of sapwood rings, the painting year falls into the period from **AD 1617 to 1623** (Fig. 4). Assuming that a few heartwood rings can be hewn away from the boards, the date of felling might be slightly later. This result coincides with the view of the art historian M. Levin, that the picture was probably made soon after another of his still lifes deposited in Stockholm and dated to about 1620 (Levin 1982). It is not possible to dendrochronologically establish the exact year of the painting of van Essen because of the lack of sapwood in the oak boards. The established period 1617-1623 also fits well with the known life dates of H. van Essen: at that time the master worked in Amsterdam and probably was in the age of his early thirties.

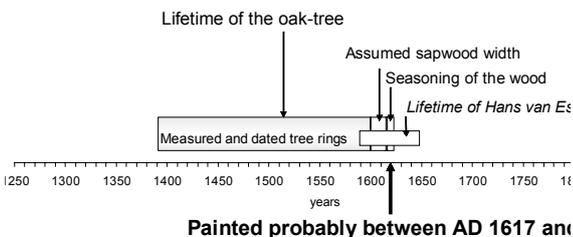


Figure 4. Probable painting period of the still life by Hans van Essen and the life period of the painter

It is curious to follow the geographical journey of the oak tree and later the journey of the painted panel made of that oak wood. Grown up anywhere in the forests of Poland or in the Baltics, the oak tree was cut, taken out of the forest and floated to a Baltic port (perhaps Gdansk or Riga), where it was split into boards. These were then exported probably to Amsterdam, seasoned for several years and joined into a panel before the painter Hans van Essen created his 'Still life with a lobster' on it between 1617 and 1623.

From the study of Mai Levin (1982) we can draw some points of the long-lasting route of the painting

from Amsterdam to Tallinn. As the painting was supplied with a leather label with a text in Russian 'Desportes in Hamburg 1814', the label became the key to explain the adventure-like history of the picture. We have no data how the painting has got to Hamburg. M. Levin tells (*op. cit.*) that the picture had been obtained by a Russian militaryman in Hamburg in 1814 under the wrong authorship of A.-F. Desportes (1661-1743). Then the painting was brought to Russia and presented to General D. P. Rezvoy, who exposed it in his collection of artpieces (including more than 40 still lifes) in his manor Marienhof in Jamburg (now Kingisepp) county near St. Petersburg, Russia. Marienhof manor belonged to the Rezvoy family until 1912 and the 'Still life with a lobster' stayed there for that long time. The artpiece got from Russia to Estonia apparently after the Russian revolution of 1917, Levin says. In 1979 a citizen of Tallinn brought this picture for expertizing to the State Art Museum of the Estonian SSR. With efforts of art restorers and art historians the meaning of the monograph of characters, E, H and V on the picture was deciphered and the above-named points of the route of the painting were established.

For today, about 380 years after its creation, the Baltic-grown oak boards have returned to a Baltic country. The painting of Hans van Essen is deposited in Estonian Art Museum in Tallinn.

Conclusions

Comparison of the tree-ring series of boards of the painting of H. van Essen, a 'Still life with a lobster', with oak chronologies of Baltic origin of T. Wazny and of J. Hillam and I. Tyers, yielded high similarity coefficients. The dendrochronological dating of the panel for the van Essen painting was determined to AD 1600. All sapwood on the oak boards has been removed. Taking into account the approximate numbers of sapwood rings in oaks growing in eastern regions of Europe, and the practised duration of seasoning of oak panels before using for painting, it was suggested that the most probable time of creation of the still life of H. van Essen was between AD 1617 and 1623. This dating fits well with the known art historical periodizing of the picture.

This was the first and successful attempt to dendrochronologically date oak wood of an old painting panel in Estonia.

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ДАТИРОВАНИЕ ЖИВОПИСИ 17-ГО ВЕКА ПРИ ПОМОЩИ ГОДИЧНЫХ КОЛЕЦ БАЛТИЙСКОГО ДУБА

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Резюме

В художественном музее Эстонии хранится масляная живопись Нидерландского художника Ханс ван Эссена «Натюрморт с омаром». Годичные кольца двух дубовых досек панеля этой живописи помогли выявить время творения картины и регион происхождения древесины. Серия ширины годичных колец панеля была сопоставлена с хронологиями годичных колец балтийских дубов Т. Важни и Дж. Хиллам и А. Тайэрс. Эти сопоставления показали, что самое позднее годичное кольцо сохранившееся в панели живописи образовалось в 1600-ом году. Внешние кольца досек (заболонь ствола) удалены. Так как приблизительное число годичных колец заболони, характерное дубам, и привычное время осушения досек для живописи в 17-ом веке известны, выявлен вероятный период творения натюрморта: с 1617 по 1623 гг. Этот период входит в известные даты жизни художника Ханс ван Эссен (род. 1587 или 1589, ум. 1642 или 1648).

Высокие показатели сходства серии годичных колец панеля живописи Ханс ван Эссена с балтийскими хронологиями дуба указывают на Балтийское происхождение древесины досок: эта экспортирована из балтийских портов. Таким образом, после трех с половиной веков балтийская дубовая древесина вернулась из Амстердама в Прибалтику.

Ключевые слова: годичные кольца, дубовая панель, Ханс ван Эссен, живопись, 17-ый век, дендрохронологическое датирование