DENDROCHRONOLOGICAL ANALYSIS REPORT

UK004/2018

Fig. 1. *Charles I and the Knights of the Garter in Procession*

JORDAENS \ VAN DYCK
Panel Paintings Project

Work requested and funded by: Jordaens & Van Dyck Panel Paintings Project (JVDPPP)

Lab reference no. (s):	**UK004__**
Documentation Date:	3 July 2018
Analysis Date(s):	July/August 2018

Object information:

Title:	*Charles I and the Knights of the Garter in Procession*
Location:	Oxford, United Kingdom
Related Artist:	Sir Anthony Van Dyck (1599–1641)
Owner:	Ashmolean Museum
Size (h x w):	29.4 x 131.9 cm
Support:	Oil on Panel
No. Planks:	4
Wood species:	Oak (*Quercus* spp.)

Dendro number / keycode:	**UK00401, UK00402, UK00403, UK00404**
Database number:	**UK004**
Analyst(s):	Dr. Andrea Seim
Method used:	Non-/Micro-invasive image analysis
Photos:	IMG_2286 – _2659
Second opinion:	Dr. Willy Tegel

DENDROCHRONOLOGICAL RESULTS

No. of annual rings:	Plank 1: 198 rings (pith and sapwood is missing) Plank 2: 45 rings (pith and sapwood is missing) Plank 3: 184 rings (pith and sapwood is missing) Plank 4: 96 rings (pith and sapwood is missing)
Dating:	Plank 1: AD 1381 – 1578 Plank 2: AD 1530 – 1574 Plank 3: AD 1411 – 1594 Plank 4: AD 1522 – 1617
Felling:	Plank 1: After AD 1588 (*terminus post quem*) Plank 2: After AD 1584 (*terminus post quem*) Plank 3: After AD 1604 (*terminus post quem*) **Plank 4: After AD 1627 (*terminus post quem*)**
Provenance:	Plank 1: Baltic region (Baltic 3) Plank 2: Baltic region (Baltic 3) Plank 3: Baltic region (Baltic 3) Plank 4: Baltic region (Baltic 3)

1. Panel support

The painting of the *Charles I and the Knights of the Garter in Procession* (Fig. 1) has a height of 29.4 cm and a width of 131.8 to 131.9 cm (Fig. 2). It consists of four oak (*Quercus* spp.) planks (Fig. 2). Plank 1 (UK00401) has a width of 22.8 to 22.9 cm and a length of 69.9 cm while plank 2 (UK00402) is 6.6 cm wide and 69.9 cm long. Plank 3 (UK00403) has a width of 14.4 to 14.6 cm and plank 4 (UK00404) has a width of 14.6 to 15.2 cm. Plank 3 and 4 have a length of 62.2 cm (Fig. 2).

All four planks were split in a non-radial direction out of the trunk of an oak tree. Compared to radial split planks which show ‘standing’ tree rings, i.e. the angle between the tree rings and the plank edge is 80-90° (see Appendix A, Fig. 1), non-radially split planks have a higher degree of shrinkage and a lower form stability.

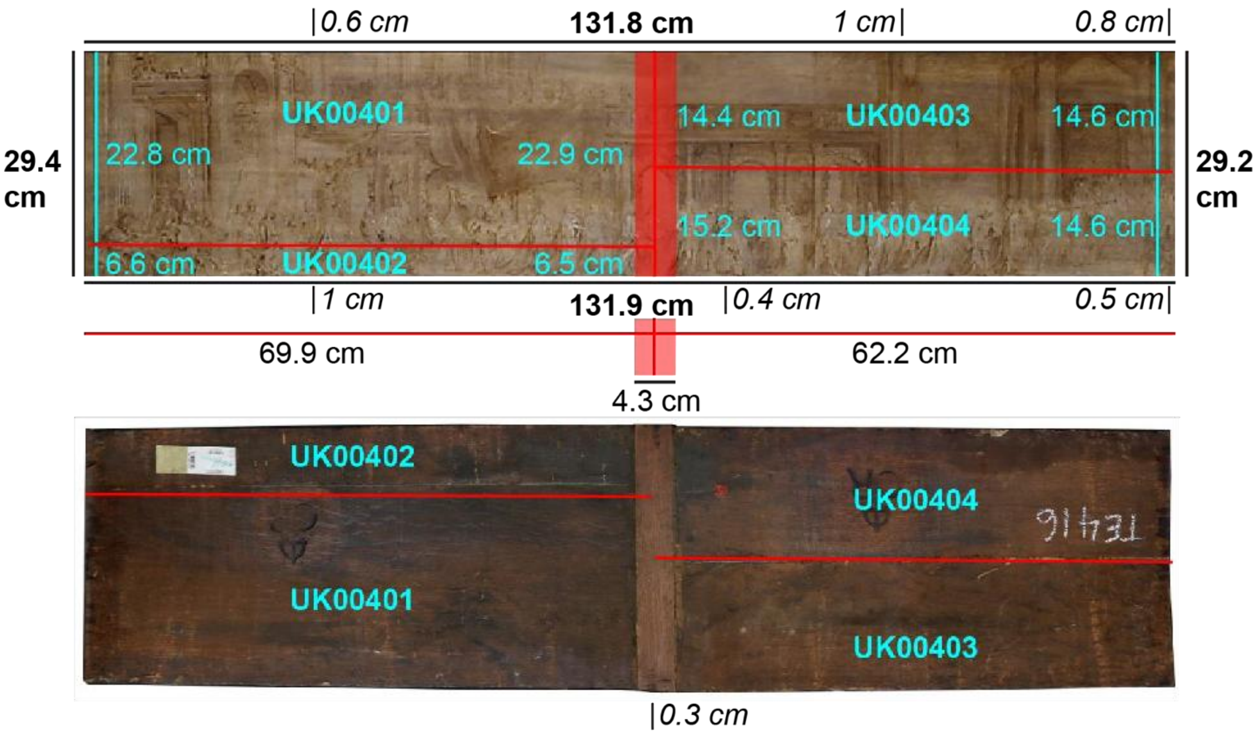

Fig. 2. Technical details of the planks used for the wooden support for *Charles I and the Knights of the Garter in Procession* shown for the front (*upper panel*) and reverse (*lower panel*) side.

Plank 1 and 2 as well as plank 3 and 4 were each glued together in a horizontal orientation (Fig. 2). The resulting two parts were again joined at the end grains using a 4.3 cm wide wooden lath. The thickness of the planks was reduced at this joint to 3 mm.

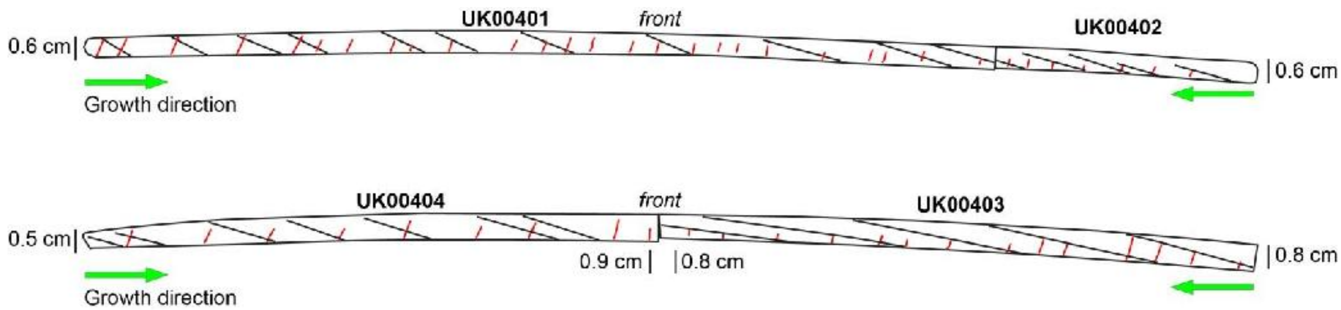

Fig. 3. Schematic cross-section of the planks at the left edge (UK00401 and UK00402; *upper panel*) and at the right edge (UK00403 and UK00404; *lower panel*) of the painting with direction of the rays (black lines) and tree rings (red lines).

The thickness of plank 1 and 2 is rather even with 6 mm (Fig. 3). Greater variation in the thickness was observed for plank 3 ranging from 5 mm at the edge of the plank to 9 mm at its center. The thickness of plank 3 is again rather even with 8 mm (Fig. 3). For the dendrochronological analysis the left edge for plank 1 and 2 and the right edge of plank 3 and 4, respectively, was used. The end-grains were prepared to make the tree rings visible. The growth direction of all four planks is indicated in Figure 3.

2. Methods

To obtain the tree-ring width measurements, non-invasive image analysis was conducted. The tree-ring widths were measured on macro-photos with 0.01 mm precision using Coo-Recorder (Cybis Elektronik & Data AB). The visual and statistical comparison and synchronization of the tree-ring width measurements with regionally different chronologies (reference database) was conducted with the PAST4 software (SCIEM). The “t-values” reported for the cross-dating statistics were calculated using the Baillie-Pilcher and Hollstein algorithms (Baillie and Pilcher 1973, Hollstein 1980). These statistical values are an indicator for the quality of the synchronization, i.e. the higher the values the better the agreement, in addition to the best visually matching position of the tree-ring width series to the reference, which is shown below.

3. Results

The measured tree-ring width series for the four planks were correlated to each other, to different reference chronologies and to measurements obtained from other panels examined by the JVDPPP.

Based on high visual (Fig. 4) and statistical (not shown) matching position to each other, the tree-ring width series for plank 1, 2 and 3 were averaged to a mean curve (UK00401-02-03).

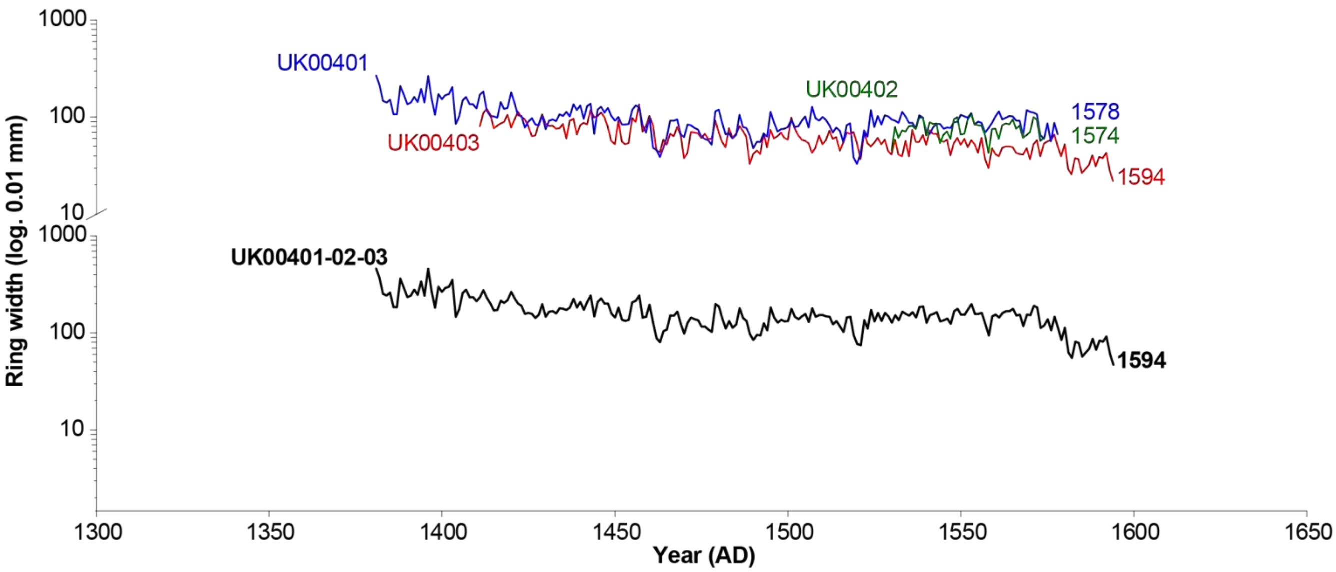

Fig. 4. Raw oak tree-ring width measurements for plank 1 (UK00401, blue line), plank 2 (UK00402, green line) and plank 3 (UK00403, red line) in overlapping position. The mean curve (UK00401-02-03) after averaging all three tree-ring width series is shown as black line.

All four tree-ring width series and the mean curve UK00401-02-03 were separately correlated with different reference chronologies. For plank 1 to plank 3 (UK00401 to UK00403) the best synchronous position was found with a non-specifed region within the Baltic region, so-called Baltic 3 (Tyers and Daly, unpubl., preliminary version) which is averaged with a reference chronology from Vilnius castle, Lithuania (Lith001; Pukienė and Ožalas 2007), so-called Baltic3/Lith001 reference. For plank 4 (UK00404) the best overlapping position was found with the JVDPPP_Baltic3 (Jordaens-Van Dyck reference based on high correlations to the Baltic 3 reference covering AD 1370–1645 by including 22 planks (unpubl., preliminary version)), and planks from other paintings investigated within JVDPPP (Table 1). Confirmation of the dating for all four planks was found with different reference versions developed for the Baltic 3 region.

Table 1. Cross-dating statistics for the oak tree-ring width series developed for the four planks and mean curve and different reference chronologies and measurements from paintings obtained during the JVDPPP. Provided are overlap (number of years), *correlation of parallel run* (Gleichlaeufigkeit in % (GL), Eckstein and Bauch 1969), significance levels (SL) (# = 95%; ## = 99%, ### = 99.9%), t-values (TBP: t-Test after transformation of the original data (raw ring-width series) using the equation after Baillie and Pilcher 1973; THO: t-Test after transformation of the original data (raw ring-width series) using the equation after Hollstein 1980) and the dating position.

Sample	Reference	Overlap	GL	SL	TBP	THO	Dating
UK00401	**Baltic 3 (Tyers & Daly, unpubl., prelim.)**	**198**	**72**	**###**	**8.35**	**8.17**	**1578**
UK00401	**Baltic3/Lith001**	**198**	**70.5**	**###**	**7.93**	**7.77**	**1578**
UK00401	**JVDPPP_Baltic 3 (JVDPPP, unpubl., prelim.)**	**198**	**70.2**	**###**	**7.82**	**7.54**	**1578**
UK00401	Z168003 (Lapiths & Centaurs, plank 3)	167	65.9	###	6.19	6.5	1578
UK00401	Z168001 (Lapiths & Centaurs, plank 1)	198	62.1	###	5.25	5.74	1578
UK00401	BI00107 (Adoration of the Shepherds, plank 7)	127	61.4	##	4.45	5.06	1578
UK00401	1SL00801 (Philip Plank 1+2 Slovenia)	198	62.4	###	6.18	4.8	1578
UK00401	0SL00819 (Philip Plank 1 Slovenia)	178	60.4	##	5.84	4.66	1578
UK00401	BI00102 (Adoration of the Shepherds, plank2)	125	64.8	###	4.55	4.53	1578
UK00402	**Baltic3/Lith001**	**45**	**73.3**	**###**	**4.27**	**3.99**	**1574**
UK00403	**Baltic3/Lith001**	**184**	**65.8**	**###**	**7.47**	**6.57**	**1594**
UK00403	**Baltic 3 (Tyers & Daly, unpubl., prelim.)**	**184**	**62.8**	**###**	**6.18**	**5.75**	**1594**
UK00403	**JVDPPP_Baltic 3 (JVDPPP, unpubl., prelim.)**	**184**	**59.5**	**##**	**6.17**	**5.35**	**1594**
UK00403	Lith001 (Pukienė and Ožalas 2007)	120	66.3	###	4.82	4.64	1594
UK00403	0BE00419 (Paul Van Dyck Besancon France)	151	61.3	##	6.12	5.18	1594
UK00403	DH00301a (Adoration of the Shepherds, plank 1, NL)	39	73.1	##	4.69	4.65	1594
UK00403	0LO00119 (London Van Dyck Saint Bartholomew)	171	58.8	#	5.36	4.43	1594

Table 1. continued.

Sample	Reference	Overlap	GL	SL	TBP	THO	Dating
UK00401-02-03	**Baltic3/Lith001**	**214**	**72.9**	**###**	**10.1**	**9.02**	**1594**
UK00401-02-03	**Baltic 3 (Tyers & Daly, unpubl., prelim.)**	**214**	**72.9**	**###**	**9.9**	**9.01**	**1594**
UK00401-02-03	**JVDPPP_Baltic 3 (JVDPPP, unpubl., prelim.)**	**214**	**71.5**	**###**	**9.56**	**8.67**	**1594**
UK00401-02-03	**Lith001 (Pukienė and Ožalas 2007)**	**150**	**65.7**	**###**	**6.23**	**5.81**	**1594**
UK00401-02-03	Z168001 (Lapiths & Centaurs, plank 1)	214	65	###	6.9	6.47	1594
UK00401-02-03	Z168003 (Lapiths & Centaurs plank 3)	183	67.8	###	6.42	6.29	1594
UK00401-02-03	Z168002 (Lapiths & Centaurs, plank 2)	214	63.8	###	5.75	5.05	1594
UK00401-02-03	0SL00819 (Philip Plank 1 Slovenia)	194	61.1	##	6.41	5	1594
UK00401-02-03	1SL00801 (Philip Slovenia Plank 1+2)	214	61	###	6.31	4.81	1594
UK00401-02-03	BI00107 (Adoration of the Shepherds, plank 7)	143	61.5	##	5.14	4.79	1594
UK00401-02-03	0BE00419 (Paul Van Dyck Besancon France)	151	64.6	###	6.14	4.7	1594
UK00404	**JVDPPP_Baltic 3 (JVDPPP, unpubl., prelim.)**	**96**	**68.8**	**###**	**6.21**	**7.56**	**1617**
UK00404	**Baltic 3 (Tyers & Daly, unpubl., prelim.)**	**96**	**71.9**	**###**	**6.37**	**6.81**	**1617**
UK00404	**Baltic3/Lith001**	**96**	**71.4**	**###**	**6.08**	**6.42**	**1617**
UK00404	0BE00529 (St Peter, Besancon, France)	84	75.6	###	5.04	5.69	1617
UK00404	AM00102 (Christ as Salvador Mundi, plank 2, NL)	82	65.9	##	4.7	5.69	1617
UK00404	1PL00301 (Satyr playing flute, Plank 1+2, Warsaw)	88	72.2	###	4.21	4.62	1617
UK00404	0SL00819 (Philip Plank 1 Slovenia)	85	62.9	##	4.9	4.47	1617
UK00404	LO01903 (Head study of a woman, plank 3, UK)	87	67.8	###	4.18	4.19	1617

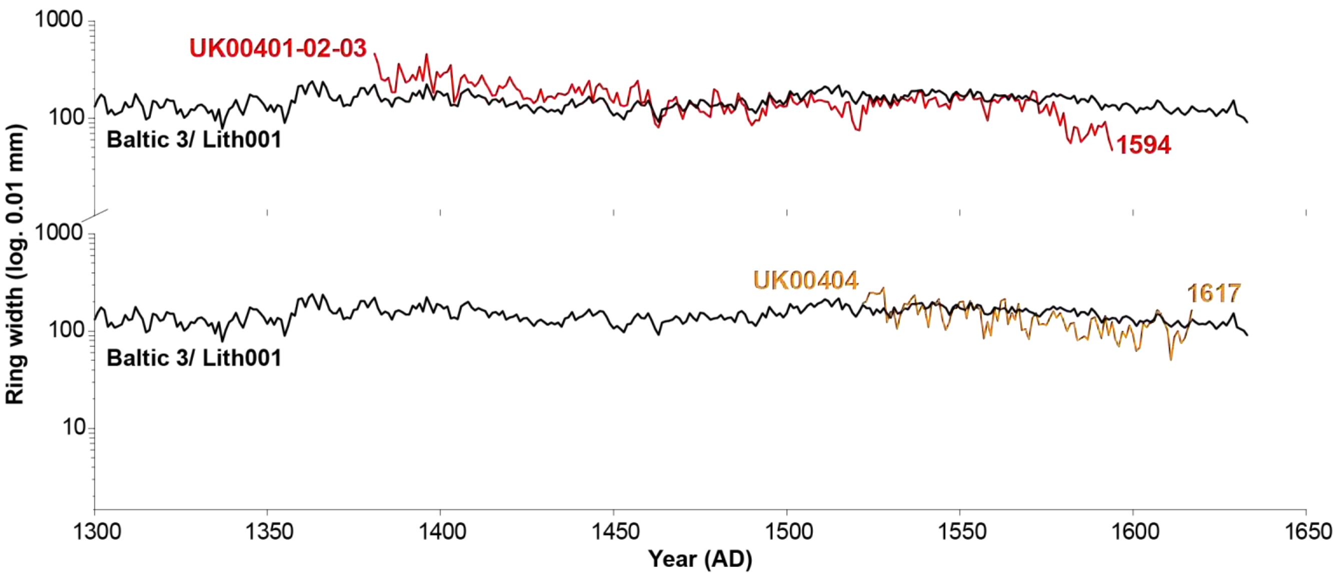

Fig. 5. Raw oak tree-ring width measurement for mean curve UK00401-02-03 (plank 1 – plank 3; red line) and for UK00404 (plank 4; orange line) in overlapping position with the reference chronology developed for the Baltic 3 region (Tyers & Daly, unpubl., prelim.) combined with the one for southeastern Lithuania (Lith001; Pukienė and Ožalas 2007) (black line).

Table 2. Overview of the tree-ring measurements for the analysed planks.

Sample	Length	Start date	End date	Mean ring width (mm/year)
UK00401	198	1381	1578	1.0
UK00402	45	1530	1574	0.95
UK00403	184	1411	1594	0.78
UK00404	96	1522	1617	1.4

For plank UK00401, a total of 198 annual tree rings were measured covering the period AD 1381–1578. Plank UK00402 has a total of 45 rings covering the period AD 1530–1575 and for plank UK00403, 184 annual tree rings were measured covering AD 1411–1594. For plank UK00404, a 96-year long tree-ring width series was developed spanning the period AD 1522–1617 (Fig. 4, Fig. 5, Table 2).

Plank 1 to 3 (UK00401 to UK00403) show similar mean ring widths of 0.78 to 1 mm per year which is characteristic for slow grown trees from a dense forest stand (the statistical average is 1.56 mm per year for ca. 97 year old oak trees based on 7284 central European oak samples covering the period 405 BC – 2008 AD; Büntgen et al. 2011). Contrary, plank UK00404 has a mean ring width of 1.4 mm per year which is indicative for medium to fast grown trees generally found in open forest stands. For the production of wooden supports, slow grown trees from dense forest stands were preferred.

Considering the width of the planks, the curvature of the tree rings, the direction of the rays (Fig. 3), and the mean ring width, the tree used for plank 1 (UK00401) is estimated to be at least 55 cm in diameter whereas the trees used for plank 3 (UK00403) and plank 4 (UK00404) are estimated to be each at least 45 cm in diameter. Since plank 2 (UK00402) has only a width of 6.6 cm, an estimation of the minimum diameter of the tree is not possible.

The sapwood rings were entirely removed for the production of the support panel, as were the rings close to the pith. Sapwood is generally removed because it is softer and more susceptible to insect damage and decomposition than the more resistant heartwood. Tree rings at the pith or close to the pith were also removed because they are more prone to breaks.

Since sapwood and waney edge (i.e. last formed ring before felling) are absent, an estimated number of 10 sapwood rings were added to the last existing heartwood ring (please not that this is an estimate). In this way, a *terminus post quem*, i.e. an earliest possible felling date, was established. **The tree for plank UK00401 was estimated to be felled after AD 1588, the tree used for plank UK00402 after AD 1584, the tree used for plank UK00403 after AD 1604 and the tree used for plank UK00404 after AD 1627. For plank UK00404 the youngest possible felling date is obtained (Fig. 6).** For the time of the production of the painting, a minimum of two years for seasoning and transport of the wood need to be added to the *terminus post quem* date.

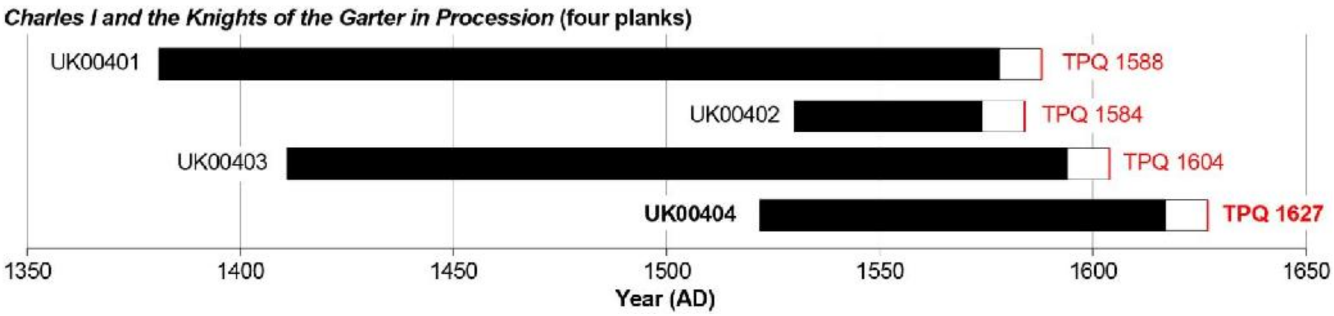

Fig. 6. Chronological position of the dated oak planks for the painting *Charles I and the Knights of the Garter in Procession*. Black bars show the period covered by the annual growth rings. The 10 added sapwood rings (white bars) are shown which led to the *terminus post quem* (TPQ) date (written in red). As youngest dated plank, UK00404 is highlighted in bold.

4. Origin of the timber

The four tree-ring sequences of the panel cross-dated best with one (i.e. Baltic 3) of the Baltic oak reference chronologies. Since these references are based on material from exported timber too, an exact location of the origin within the Baltic region cannot be determind. However, it is possible to distinguish between different groups of the Baltic timber, named Baltic 1, Baltic 2 and Baltic 3 (Hillam & Tyers 1995; Tyers & Daly, unpubl., prelim.). These three groups are composed of trees with common ring width patterns and most probably represent forests in different areas within the region. The exact location of the forests within these three groups is, however, not yet identified. Figure 6 shows the potential timber supply for western Europe during the 14^{th} to 16^{th} century from the so-called "Baltic region".

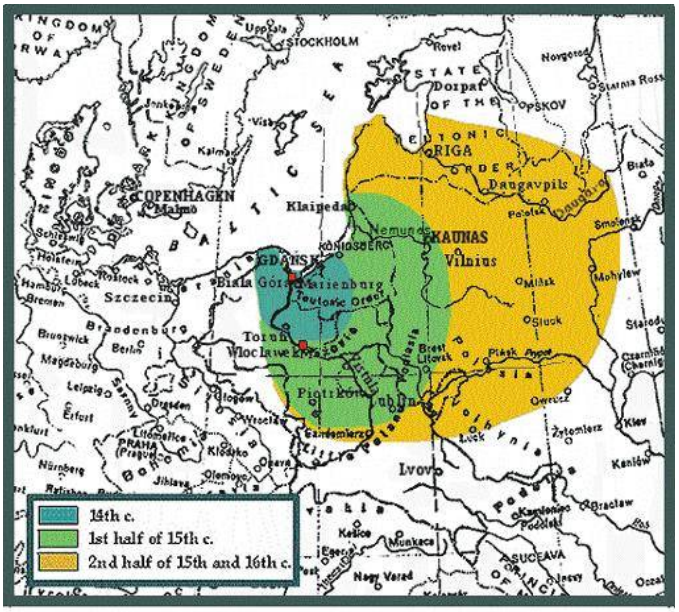

Fig. 1..Baltic Sea catchment area showing the potential region of oak supply for western Europe (■ means custom post registered the Vistula trade).

Fig. 6. The map which is based on historical archives and dendrochronological evidence shows the origin of oaks that were exported to western Europe (Ważny 2005).

5. Panel maker's and/or Antwerp guild brand marks

On the reverse of the painting, no panel maker's and/or Antwerp guild brand marks were found (Fig. 7). However, two brand marks of the collection of King Charles I and an as yet unidentified wax collector's seal are visible (Fig. 8).

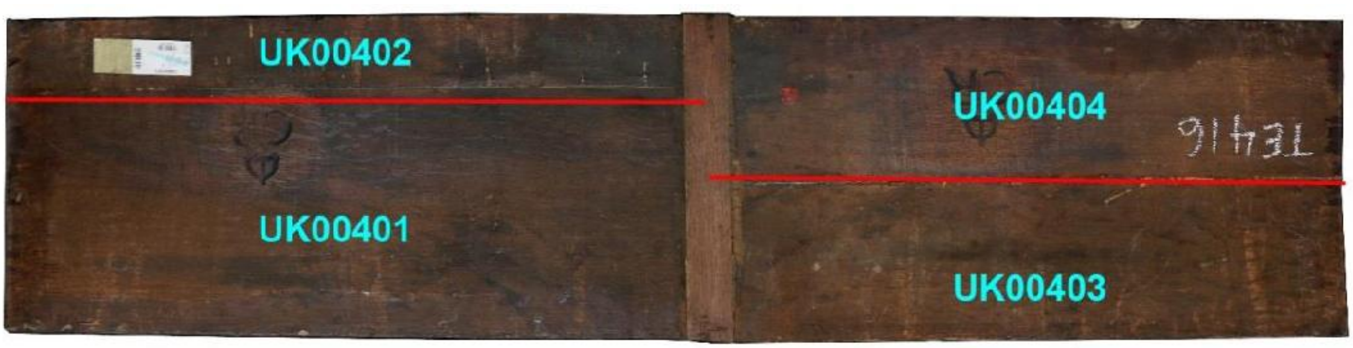

Fig. 7. Reverse of the painting.

Fig. 8. Close up of the brand mark of King Charles I (*upper pane*l) and a wax collector’s seal (*lower panel*).

Dendrochronological analyst

Dr. A. Seim
Freiburg, 14 August 2018

For further information about dendrochronology, the interpretation of the felling year and provenance, please see Appendix A.

Appendix A

General information about dendrochronology and tree-ring dating of oak panels

The first part of this report presents information about the oak panel and planks that were analysed, and gives a summary statement followed by a brief description of the panel and planks. For each dated plank, the period covered by the preserved annual growth rings in terms of the calendar year (the year when the oldest and the youngest preserved ring was formed) are presented. The interpretation of the results may, however, not always be straight forward. This appendix therefore contains brief explanations of common expressions and interpretations in the reports.

Cutting directions

A trunk can be split in different directions and thus the resulting planks show different curvatures of the tree rings and directions of the rays. Figure 1 shows a schematic representation of the main cutting directions.

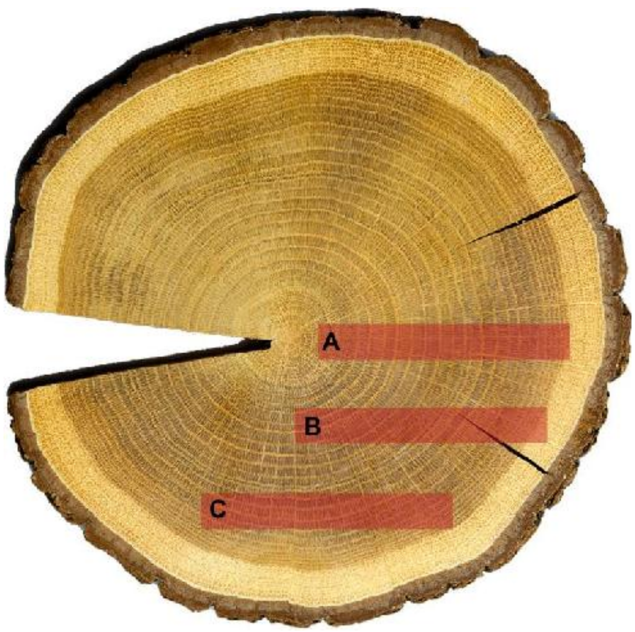

Fig. 1. Cross-section of an oak trunk showing different cut boards:

- **A)** Quarter sawn (radial) – the angle between the tree rings and the plank edge is 80-90° (= vertical grained boards);
- **B)** False quarter sawn – the angle between the tree rings and the plank edge is 45°;
- **C)** Plain sawn (tangential) – tree rings are parallel (tangential) to the plank edge (= flat grained boards).

Interpretation of a dating and calculation of felling year

A dendrochronological study will provide information about the years during which the preserved growth rings in the studied wooden object were formed, and when the tree was felled. The possibility of obtaining a precise date of the tree felling (annual or sometimes even intra-annual date) depends on whether bark, wane, or sapwood is preserved (Fig. 2). If there is bark preserved, or if possible to determine whether wane (the latest formed annual ring located immediately beneath the bark) is preserved, an exact year for the tree felling can be determined. It can also be indicated whether the timber was harvested during the growth (spring/summer) or dormant (autumn/winter) season.

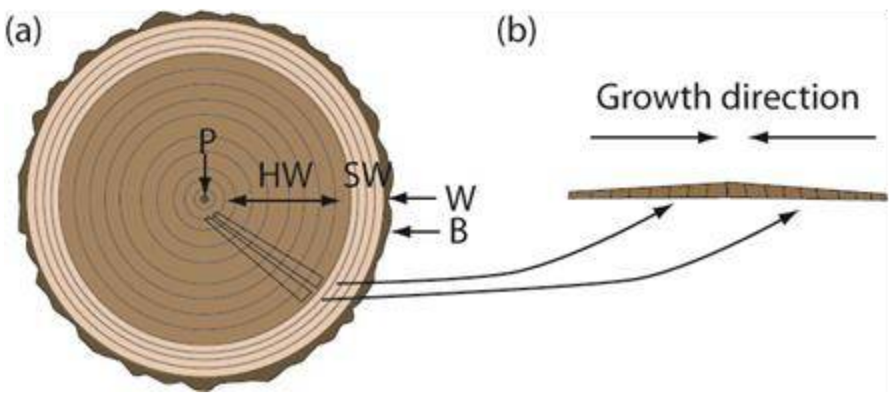

Fig. 2. (a) The figure shows a schematic cross section of an oak tree with pith (P) in the centre, thereafter heartwood (HW), sapwood (SW), wane (W), and bark (B). The oldest rings are located closest to the pith, whereas the most recently formed ring is located just beneath the wane and bark. A line drawing indicates the parts of the trunk that may be used for e.g. oak panels. (b) According to guild regulations the relatively soft sapwood is most often removed from the panels before they are joined together. It is therefore often difficult to obtain an exact felling year for the oak trees used in panel paintings (Fig. by J. Edvardsson).

The sapwood is located just beneath the bark of the tree and includes the last formed growth rings. If bark or wane is missing and only parts of the sapwood is preserved, the approximate felling date can be calculated with high accuracy since the approximate number of missing growth rings in the sapwood can be estimated (Fig. 3). To estimate the number of sapwood rings, statistics based on numerous empirical studies can be used (e.g. Hollstein 1980; Wazny 1990; Hillam and Tyers 1995; Sohar et al 2012). Such studies have found an east-west gradient in the average number of sapwood rings in oaks which is likely caused by the forest stand density. Oak trees that contain many growth rings (relatively old or slow growing trees) tend to have more growth rings in the sapwood compared to fast growing or young trees. To summarise, the estimates of the amount of missing sapwood rings in oak trees are most often based on both from which geographical region the tree is believed to originate (see section about provenance) and the age the tree had when it was felled. If the sapwood is completely missing, it is only possible to set the earliest possible felling date, referred to as a *Terminus post quem* (TPQ) by adding an estimated number of sapwood rings to the last heartwood ring.

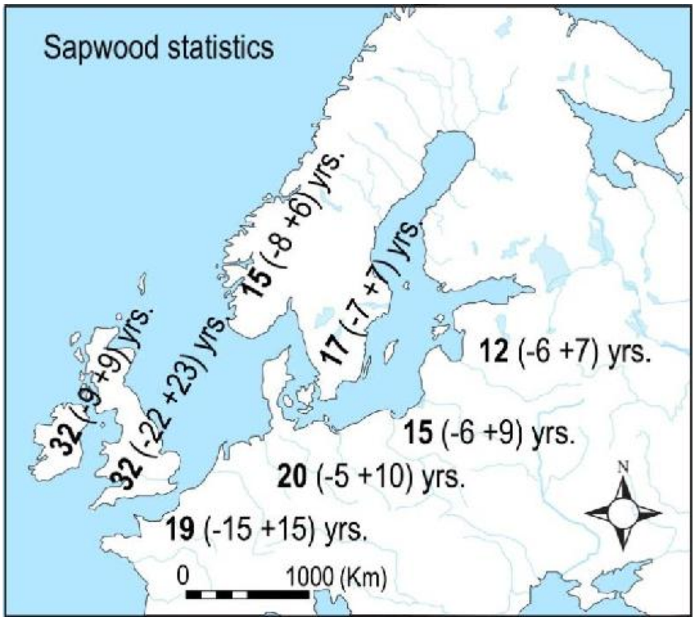

Fig. 3. Sapwood estimates for oak trees in Northern Europe. The figures in bold show the average value for the sapwood in different geographic regions, whereas the numbers in brackets show normal variability of the sapwood. The estimates presented are based on a large selection of studies of oak trees (e.g. Wazny, 1990; Hillam & Tyers, 1995; Sohar et al., 2012), as well as statistics used by dating laboratories in Northern Europe (Fig. by J. Edvardsson).

Provenance

Climate and environmental factors influence the radial growth of trees (Fritts, 1976). Trees growing in different geographic regions therefore show variations in their growth patterns. The provenance for trees can therefore be indicated based on statistical and visual comparisons to reference chronologies developed from trees originating from various geographic regions. A problem with e.g. the Baltic material, however, is that as many tree-ring chronologies have been developed from oak trees that were exported to Western Europe. It has therefore not as yet been possible to say precisely where many of the trees grew. It is, however, possible to distinguish between different groups of the

Southern Baltic timber and these groups most probably represent forests in different areas within the region. In some cases, however, the origin of the trees might be known, which generates a more precise provenance. The interpretation of the provenance of the trees may therefore vary significantly depending on which reference chronology that matches the plank(s)/sample(s) the best and what is known about the timber used for this specific chronology.

Time between tree felling and usage

Comparisons using felling dates from dendrochronological studies and information from cultural historical studies (written sources, inscriptions, and the like) often indicate that under normal circumstances trees have been used shortly after the felling. A study from Hamburg University, for example, performed on almost 200 paintings on oak panels where the artists had signed and dated the painting, revealed that there rarely have been more than 5 years between the felling of the tree and the production of the painting. These findings are supported by similar comparisons performed on timber from buildings in Denmark. More recent studies indicate that as little as two years differed between tree felling and production of the painting, at least for 17th century panels (Klein and Wazny, 1991; Fraiture, 2011). However, the 15th and 16th century panels were generally thicker than those of the 17th century, and may therefore have had stored and treated during a bit longer periods (maybe an average of 5 years).

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Appendix B

Tree-ring width data for UK004 (Heidelberg format):

```
HEADER:
Keycode=UK00401
Length=198
DateEnd=1578
Species=QUSP
Location=VD_CharlesIProcession_plank1_Oxford-Ashmolean
DATA:Tree
   268   211   146   140   151   107   107   210   171   135
   140   162   143   194   140   265   155   106   172   153
   167   172   203    85   101   148   161   135   135   123
   171   183   116   102   101    98   142   121   124   179
   138   104   102    78    90    96    83    82   104    75
    92    95    90   107   102   113   101   136   118   130
    96   130   138    67   118   128   111   124   102    92
   100    84    83    85   119   132   126    82    69    98
    48    46    39    48    62    92    92    95    66    62
    84    82    77    74    62    60    58    52   114   118
    88    66    68    60    65   105    79    76    64    48
    55    56    68    62   113    88    70    75    76    79
    93    79    80    92   101    78   128    96    92   100
    94    82    69    78    72    55    82    86    38    33
    42    73    62   118    79   102    83   104   100    94
    92    87   112   101    88    86    76   104    98    70
    67    79    85    85    76    78    77    88    89   105
   101    98   110    84    90    87    69    77    87   102
   114    94    98   102   102    92    92    64   118   112
   112   107    66    60    86    56    86    66     0     0
HEADER:
Keycode=UK00402
Length=45
DateEnd=1574
Species=QUSP
Location=VD_CharlesIProcession_plank2_Oxford-Ashmolean
DATA:Tree
    56    98    76    91    88   100   101    93   122   123
    80   110   105   107    67    82    88    74   118   124
    82    83   117   133   104   103   101    80    53    93
    95    74   103   107   104   118    95   101    76    82
    87   124   116    71    76     0     0     0     0     0
```

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HEADER:
Keycode=UK00403
Length=184
DateEnd=1594
Species=QUSP
Location=VD_CharlesIProcession_plank3_Oxford-Ashmolean
DATA:Tree
   100   137   150   131    96   101   107   112   131    97
   118   140   125   118   100    79    80   105   133   105
   101   101    94    96   105    75   115   119    82   102
   109   104   146   123   128   139   124    99    71    65
   115    70    65    67   121   111   168    88   100   127
   102    56    54    73    64    83    79    98    82    47
    53    87    86    85    76    83    74    74   115    87
    69    61    96    76    83   100    89    78    41    52
    56    52    83    61    92    75    79    86    76    73
   122    96    80    73    71    67    53    60    80    65
    72    89    74    77    56    68    86    84    87    67
    46    87    67    62    68    76    65    73    55    51
    73    51    49    71    49    92    69    69    81    64
    91    83    84    72    69    73    50    67    76    64
    74    61    72    65    53    76    46    37    59    52
    49    60    62    62    61    53    52    51    59    46
    65    72    49    66    70    72    82    63    49    65
    36    32    47    46    33    36    40    50    39    48
    47    53    35    27     0     0     0     0     0     0
HEADER:
Keycode=UK00404
Length=96
DateEnd=1617
Species=QUSP
Location=VD_CharlesIProcession_plank4_Oxford-Ashmolean
DATA:Tree
   192   201   248   246   239   242   280   123   156   157
   105   153   189   188   212   232   148   180   165   110
   198   190   213   133   103   123   170   170   197   200
   135   204   172   175   163    83   125    90   171   127
   203   211   118   153   130   189   103   104    82   134
   153   116   118   115   134   158   136   152   130   100
   119   121    80    84    88    81   133   138   109    85
   142    91   124    81    69    98    86   115    93    63
    67   120   109   123   125   163   150   124   103    50
    87   100    75    84   110   164     0     0     0     0
```

HEADER:
Keycode=UK00401-02-03
Length=214
DateEnd=1594
Species=QUSP
Location=VD_CharlesIProcession_plank1-3_Oxford-Ashmolean
DATA:Tree

268	211	146	140	151	107	107	210	171	135
140	162	143	194	140	265	155	106	172	153
167	172	203	85	101	148	161	135	135	123
136	160	133	116	98	100	124	118	127	152
131	116	110	91	93	91	82	90	114	85
95	97	92	103	103	100	106	130	106	121
100	121	140	86	122	132	115	116	92	83
105	79	77	79	120	125	140	84	84	112
75	51	46	60	63	88	87	96	71	57
73	84	80	78	67	67	63	59	114	108
81	65	77	66	71	103	82	77	56	49
55	54	73	62	106	84	73	79	76	77
103	85	80	86	91	74	103	84	88	88
86	85	71	77	67	59	83	85	54	44
43	78	64	99	75	93	77	94	85	74
88	78	95	90	87	95	84	107	108	74
89	91	94	75	78	82	72	98	102	89
89	102	115	91	90	93	71	55	86	90
83	93	97	97	103	87	90	68	90	89
110	106	66	69	81	62	85	65	49	65
36	32	47	46	33	36	40	50	39	48
47	53	35	27	0	0	0	0	0	0