Dendrochronological research of the left Van Mekeren cabinet at Amerongen Castle (the Netherlands)

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SUMMARY

The left Van Mekeren cabinet at Amerongen Castle was inspected to identify elements suitable for dendrochronological research. The aim of the research was to determine the potential production time of the cabinet through the date and provenance of the wood. Only an inner shelf of oak (*Quercus* sp.) could be selected, as the rest of the elements in the doors and drawers had their transverse ends covered. The part of the shelf that could be measured contained 87 tree rings, and the resulting tree-ring sequence could be dated to 1678 with a chronology from Lower Saxony, in Germany. Since sapwood is absent in the wood, the felling of the tree was estimated to have happened after 1685 C.E. Considering two to five years for the transport and seasoning time of the wood, the earliest possible production period of the painting would be from 1687 to 1690 C.E..

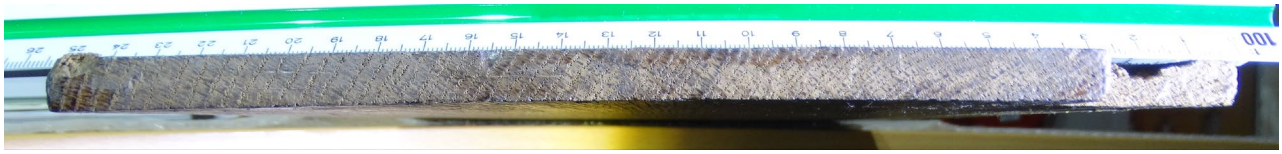
INTRODUCTION

Jan van Mekeren (Tiel, ca. 1658 – Amsterdam 1733) is the only late-17th century cabinetmaker to which specific pieces of furniture can be firmly attributed. Amerongen Castle in the Netherlands, displays two of these cabinets in the Grand Salon, located on both sides of the entrance door. The cabinet placed on the left-hand side of the door is the object of this study. This is the only known cabinet by Van Mekeren that combines the large floral marquetry of the doors with scrolls on the drawer front of the stand and around the bottom and frieze of the cabinet (Fig. 1). The aim of the research was to establish the date and provenance of the wood, to determine the potential production time of the cabinet.

Figure 1. Van Mekeren cabinet situated to the left-hand side of the door of the Grand Salon at Amerongen Castle (photo: René Gerritsen kunstfotografie).

MATERIAL AND METHODS

During the inspection of the cabinet at Amerongen Castle it was noticed that the transverse end of the elements conforming the doors and the drawers were not accessible for dendrochronological research. Only an inner shelf had the transverse ends exposed (Fig. 2). Therefore, this element was the only one selected for dendrochronological research. Pith and sapwood were absent on the wood. No tool traces were observed either.



The dendrochronological research was carried out on the transverse sections at both ends of the shelve. No prior preparation of the surface was required to visualise the tree rings. The surface was only cleaned slightly with a brush. Tree rings were photographed with a macro lens, and ring widths were measured on screen with CooRecorder (Cybis). The photographs included a ruler to allow the calibration of the measurements. Therefore, the obtained ring widths represent absolute values. Crossdating was done in PAST4 v. 4.3.102 (SCIEM).

RESULTS DENDROCHRONOLOGICAL RESEARCH

The measurements obtained from both transverse ends were merged into a mean curve containing 87 tree rings. Crossdating with reference chronologies from central, northern and eastern Europe resulted in the dating of the shelf in 1678 C.E. with a chronology from Lower Saxony, in Northern Germany (Table 1, Fig. 4).

The absence of sapwood rings in the wood hampers the estimation of the felling date of the trees within a range of years. Therefore, only a *terminus post quem* date can be provided. Considering the sapwood statistics of trees growing in Germany provided by Hollstein (1965, 1980) and compiled by Haneca et al. (2009), it can be estimated within a 95% confidence interval that the tree from which the shelf was obtained was cut *after* 1685 C.E..

Table 1. Results dendrochronological research. N: number of measured rings. Pith: estimated nr of rings missing to pith; SW: number of sapwood rings; WK: bark edge: number indicates estimated number of missing rings to bark edge. CC: correlation coefficient; TBP: Student's *t*-value according to Baillie and Pilcher (1973); %PV: percentage parallel variation (Eckstein and Bauch, 1969); ###, significance level of %PV at $p<0.001$.

Element	DR Dendrocode	N	Pith	SW	WK*	Begin year	Last year	Estimated felling date	CC	TBP	%PV	Reference chronology
Inner shelf	10140010	87	-	-	>7	1592	1678	After 1685	0.57	6.18	70.1###	nssub1hl**

*Estimation based on Hollstein (1965, 1980) for the 95% confidence interval, as reported by Haneca et al. (2009).
** Reference oak chronology developed by Leuschner (unpublished).

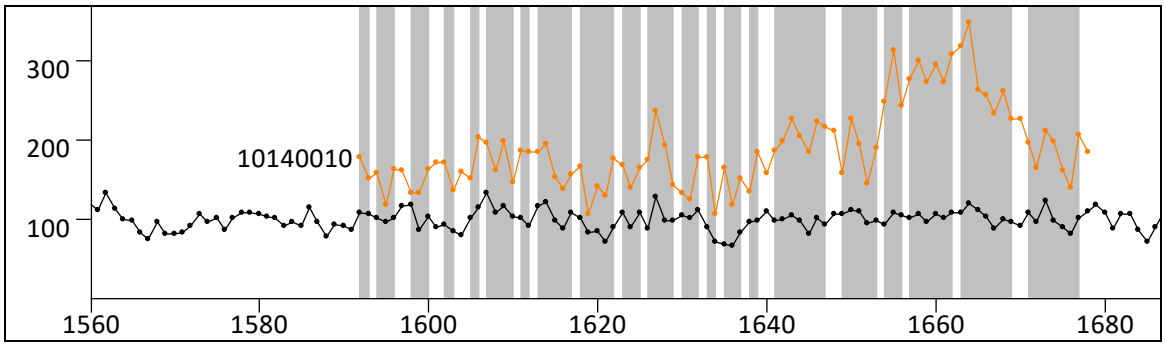


Figure 4. Visual match between the tree-ring series of the shelf (10140010; orange) and the reference chronology nssub1hl (black). Y-axis: ring-width (1/100 mm); X-axis: calendar years. The shaded area shows the percentage of parallel variation (%PV) between the tree-ring series and the reference chronology.

CONCLUSIONS

The dendrochronological research has provided a date for the outermost tree ring present in the wood of the inner shelf (1678 C.E.). The cutting of the tree has then been estimated to have occurred after 1685 C.E.. To infer when the cabinet could have been made, a couple of years must be added to account for the transport and seasoning of the wood. To my knowledge, no observations have been published yet about the lapse of time between the felling of trees and the construction of cabinets. From observations of panel paintings signed by the artists and retaining partial sapwood it has been proposed that the transport and seasoning added up from two to five years in the 17th century (Klein et al., 1987; Wadum, 1998). Those numbers would place the earliest production time of the cabinet between 1687 and 1690 C.E. Given that the tree-ring series is rather short (less than 100 rings) , and that the minimum number of sapwood rings used here is quite low (and could be in reality much higher), it is plausible that the cabinet was made a few years later.

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Appendix A. Glossary and abbreviations

N	Total number of measured rings in the sample;
Pith	Centre of the tree; +1/-, pith present/absent;
SW	Number of sapwood rings present on the board.
Bark edge (WK)	Boundary between the last ring and the bark; WK: bark edge present; when absent, an estimation of the number of rings to the bark edge might be given depending on the wood species;
Begin year	Date of the first ring (closest to the pith of the tree) measured in the sample;
Last year	Date of the last ring (most recent ring, closest to the bark of the tree) measured in the sample;
Estimated felling date	Date of the last ring plus the estimated mean number of rings to the bark edge when the WK is not present;
TBP	Value of the Student *t*-test according to Baillie and Pilcher (1973); this value is used to identify the match between two tree-ring series for which the correlation reaches its highest value. Student's *t* values over 5 for an overlap of 100 rings are likely to indicate a match;
%PV	Percentage of parallel variation; this value indicates, for the overlapping period between two tree-ring series, the percentage of years in which the ring-widths increase or decrease similarly. Values higher than 65%, for an overlap of 100 rings are highly significant and indicate a match;
Overlap (Ol)	Number of overlapping rings between two curves in their matching position;
Reference chronology	Chronology used to date the sample.