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ORIGINAL ARTICLE

Dating furniture and coopered vessels without waney edge – Reconstructing historical wood-working in Austria with the help of dendrochronology

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ABSTRACT

In the present study, 208 furniture and 168 coopered vessels from three Austrian museums were examined. Dendrochronology was used to date objects and to extract further information such as the necessary time for seasoning, wood loss through wood-working and methods of construction. In most cases sampling was done by sanding the cross section and making digital photographs using a picture frame and measuring digitally.

The dendrochronological dates of the sampled furniture range between 1524 and 1937. The group of furniture includes cupboards, chests, tables, benches, commodes and beds. In many cases furniture was artfully painted and sometimes even shows a painted year. With the help of dendrochronology it was proved that some objects had been painted for some time after construction, or had been overpainted. Most furniture, however, was painted immediately after completion. In this case, the seasoning and storage time of the boards and the wood loss due to shaping can be verified. As an average value, 14 years have passed between the dendrochronological date of the outermost ring and the painting. The time span includes time of seasoning and storage and the rings lost by wood-working. This leads, on the one hand to a short storage time of less than 10 years and on the other hand to very little wood loss due to manufacturing. Those boards being less shaped turned out to be back panels of cupboards, therefore they are recommended to be sampled for dating.

Coopered vessels were dated between 1612 and 1940. There was evidence that staves were split and not sawn in many cases. The staves were often split out of the outermost part of the tree and hardly any wood was worked away which was proved by the close dendrochronological dates of the single staves of a vessel.

Since there is a short time of storage and only little wood loss through wood-working, dating of objects without a waney edge becomes reasonable.

Introduction

Wood-working includes many different crafts, each having its own rules and traditions. In the present study the Austrian traditions of the furniture and coopered vessel production are illuminated with the help of dendrochronology.

Wood-working craftsmen have always been specialised to the one or other craft. However, in Austria it was not until the late 14th century, that all these specialists were combined in the professional craft ("Zunft") of carpentry. By 1382 joinery and cooperage became separate crafts and started to develop and to specialise their way of working (Radkau and Schäfer, 1987).

Country furniture

In Austria, a line can be drawn between furniture produced for urban and courtly use, and for rural use. In this investigation only country furniture is included. It was generally produced by three different circles: professional joiners, mobile wageworkers and farmers themselves (Moser, 1949). In some cases, endowment-furniture was bought on the local market, but most furniture was made by wageworkers or farmers (Moser, 1947). The group of furniture produced domestically by farmers is often hard to distinguish. Through the centuries, farmers have developed their own skills and traditions. Often, folkloristic dating can be difficult, because

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there is still a lot of uncertainty (Moser, 1949). The design did not follow any style trend, but their own tradition, that often did not change for a long time (Moser, 1949). It has been asserted that joinery methods hardly changed over centuries in the Tyrol (Colleselli, 1968). Furthermore, from the 13th and 14th century on, farmers started to gain sophisticated skills and knowledge about recognisable wood-working techniques (Moser, 1949). This makes the distinction between furniture produced by farmers and by joiners difficult today.

Furniture has often been embellished with some kind of painting and in Austria the famous, colourful, baroque surface-painting of wooden furniture started at the end of the 17th (Lipp, 1964). Today, paintings can help to date furniture from a folkloristic point of view, but sometimes this does not date the production of the furniture itself. Furniture was part a wedding endowment. Often it was specially produced, but sometimes old furniture was over painted for this occasion (Bader, 1998). Lipp (1986) mentions professional painters not being wood-workers at all, but working on old unpainted cupboards.

Coopered vessels

To save transportation costs, the roughing out of staves took place in the woodland, where stems were debarked, split (Voigt, 1930) and air-dried (Grünn, 1968). The moister content which can be reached by natural drying is about 15% (Bosshard, 1975). To reach this moisture content, the coopers calculated half a year per one centimetre for softwood and one year per one centimetre for hardwood (Grünn, 1968; Kindler, 1949). A vast amount of high quality wood was needed for the coopered vessel production (Radkau and Schäfer, 1987). Until the middle of the 20th century, most coopered vessels were produced by splitting (Kindler, 1949).

Possibilities of dendrochronology

Dating objects like furniture and vessels often does not lead to an absolute date of the construction year. First, some years or tree rings get lost by wood-working and second, boards were seasoned for some years before use (Waldner, 2005).

Nevertheless, dendrochronology leads to interesting discussions. On the one hand the age of the furniture can be proved; on the other hand historical wood-working processes might be reconstructed. Eckstein (2007) states that the work of the dendrochronologist is the translation of information stored in tree rings into human language. This describes quite well, the aim of the present study. There is some "translation work" already done for panel-paintings (e.g. Eckstein et al., 1986) and musical instruments (e.g. Beuting, 2011), however only few analyses have been made on country furniture (Waldner, 2005; Thun and Alsvik, 2009) or historic coopered vessels (Waldner, 2006) up to now.

Hypotheses

At the beginning of the work four hypotheses were stated:

1. For many centuries, harvesting timber was under strict regulations in Austria (Johann, 1994). The large amount of wood which was needed for mining activities led to strongly varying regional differences in wood availability (Johann, 1968). Consequently wood was a valuable commodity in historical times and as little wood as possible was removed by the wood-working process. Therefore the dendrochronogical dates without waney edge are close to the construction date. This can be verified by searching for boards showing a waney edge, by focusing on the shape of the board and by referring to the region where the board was cut out of the tree.
2. Drying times were much shorter than expected. The seasoning and storage was never longer than one generation, usually even less. This is the second precondition for the high expressiveness of the dendrochronogical dates and can be proved by dating objects with a painted year.
3. Folkloristic dating does not always meet the construction period. In some cases furniture was over painted, leading to wrong year of manufacturing.
4. Boards or staves of one object were often sawn or split out of a single tree. This hypothesis can be verified by internal dating. It will give a hint on working methods. One assumption was that one tree was chosen to split out all staves for the production of a vessel. Waldner (2006) proved this previously when dating a mediaeval vessel.

Material and methods

Furniture and vessels from three Austrian museums have been analysed. One museum is located in Malta in Carinthia (Bauernmöbelmuseum, Probstkeusche), in the very southern part of Austria, another one is located in Stainz in Styria (Landwirtschaftsmuseum), in the south-eastern part of Austria, and most objects belonging to the Austrian Open Air Museum in Stübing, close to Graz in Styria, where houses and objects from all over Austria were available.

Sampled furniture includes cupboards, chests, tables, beds and commodes. The wood-working method and the thickness of the boards varies greatly between the furniture from different regions. Most of the cupboards and chests have been painted in the local tradition. Folkloristic dating was not part of the analysis. However, if the painted furniture was dated, it was helpful to interpret dendrochronological results.

The term "vessel" includes casks and open vats of different size, most being kept together with a wooden ring. Open vats have a wall thickness of 10–20 mm, casks have a thickness of 30–40 mm.

All museum objects were prepared for measurement in situ and never left their location. First, the cross-section was sanded. Unfortunately, sanding itself cannot be seen as non-destructive. Hence a lot of effort was set on selecting the boards. Sanding furniture was either done on non-painted or non-visible boards. Vessels were sanded on the bottom part of the staves.

Direct measurement of the rings on the radial surface would have been non-destructive, but the innermost rings were often distorted if the log had not been sawn directly through the pith, and some surface preparation was often required.

This preparation was carried out using a small precision bore grinder, having a spindle collar of 20 mm in diameter was used. The sanding paper of the same size was glued to the collar in grain size 120, 240 and 600. Two pictures of sampling are shown in Fig. 1.

After sanding, the sample was photographed using a scaled frame to make calibration possible before tree ring measurements. Furthermore the reference frame guarantees a constant distance between the object and the lens, which is necessary, if the board was too big for the frame and more pictures had to be overlapped digitally. The picture-frame was self-made of plastic and brass profiles with scaling dots applied in 10 mm distance, as shown in Fig. 2. The inner size of the frame was chosen at 75 mm × 45 mm, the frame bridge with the scaling dots was produced in 12 mm width. This size of the frame seemed to be most suitable – not too big, so that very narrow rings could be measured in high resolution and not too small, so that only a few pictures of one board had to be taken. Only if the cross-section was not accessible and the board was