National museum
PALACE
OF THE GRAND DUKES
OF LITHUANIA

H W U
WOOD WORKING

2-6 SEPTEMBER 2017
VILNIUS, LITHUANIA

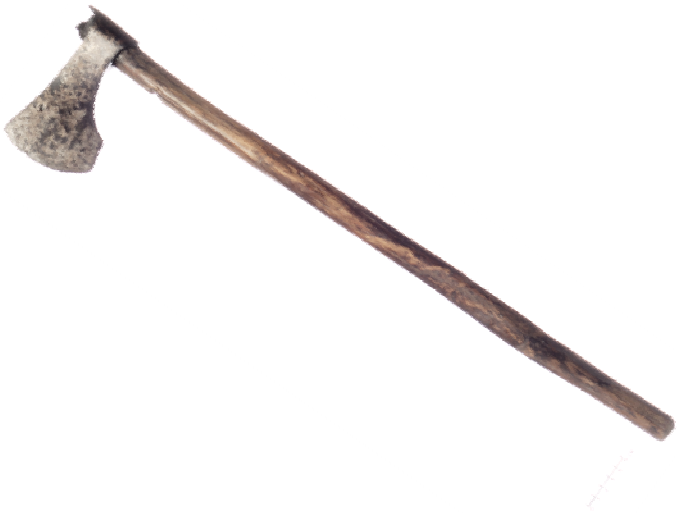
State Cultural Reserve of Kernavė

Fifth Workshop

Historical Wood Utilization: Woodworking

September 2nd to 6th, 2017; Vilnius, Lithuania

PROGRAMME & BOOK OF ABSTRACTS



Vilnius, 2017

Fifth Workshop

Historical Wood Utilization: Woodworking

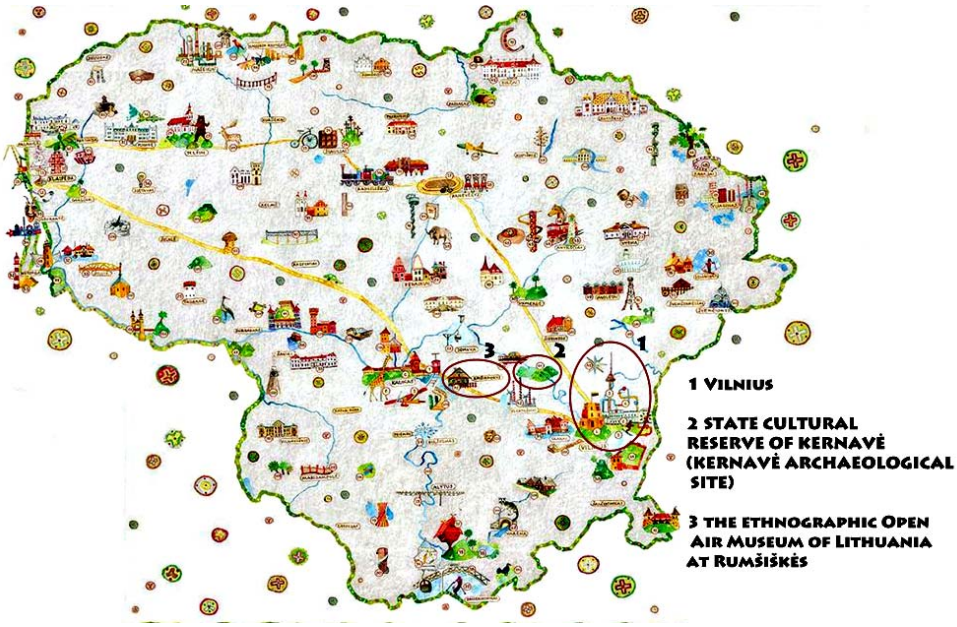
September 2nd to 6th, 2017; Vilnius, Lithuania

Organizers
National Museum – Palace of the Grand Dukes of Lithuania,
with a partnership of
State Cultural Reserve of Kernavė

Organizing Committee
Michael Grabner, Vienna, Austria
Rūtilė Pukienė, Vilnius, Lithuania
Irutė Kaminskaitė, Vilnius, Lithuania
Rasa Bertašiūtė, Rumšiškės, Lithuania

Programme & Book of abstracts,
compiled by Rūtilė Pukienė & Irutė Kaminskaitė, August 2017

Places
1. Venue, presentations: National Museum – Palace of the Grand Dukes of Lithuania, Katedros sq. 4, Vilnius
Trips, practical sessions:
2. State cultural reserve of Kernavė (5 September)
3. The Open air museum of Lithuania (4 September)



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Fifth Workshop

Historical Wood Utilization: Woodworking

September 2nd to 6th, 2017; Vilnius, Lithuania

PROGRAMME

2nd September, Saturday

	Arrival
18.00-19.00	Registration at the National Museum Palace of the Grand Dukes of Lithuania, Visitors Centre, Katedros sq. 4.
19.00-21.00	Ice-breaker with an opening of the Chamber Exhibition "Tools for Woodworking and not only..." at the Auditorium of the Museum, entrance from the Visitors Centre, Katedros sq. 4.

3rd September, Sunday

8.40-9.00		Registration		
9.00-9.10		Opening		
		I Session of oral presentations		**Prehistoric woodworking**
1	9.10-9.30	**Katarina**	**Čufar**	Questions of woodworking - from pile dwellings to pre-modern architecture
2	9.30-9.50	**Bernhard**	**Muigg**	Neolithic wood working in north-eastern France
3	9.50-10.10	**Silke**	**Lange**	Wooden artefacts in the Netherlands from prehistoric times until 1300 AD
4	10.10-10.25	**Julia**	**Weidemüller**	Can construction tell us anything about the constructor? A typology of ancient wells in Bavaria

3rd September, Sunday, continued

10.25-11.00		Coffee break		
5	11.00-11.20	**Caroline**	**Vermeeren**	Using branch age and diameter to identify woodland management: new developments
6	11.20-11.35	**Claudia**	**Baittinger**	Different kinds of 'under-water-fences' in the Baltic from various periods
7	11.35-11.50	**Kęstutis**	**Peseckas**	Wood working at Šventoji Bronze Age river
8	11.50-12.30	**Wulf**	**Hein**	Ergersheim Experiments 2011-2017
	12.30-12.50	Discussion		
13.00-14.00		Lunch at the cafe of the Vilnius University, Universiteto str. 4.		
I Practical session		**The Vilnius Castles, Wooden heritage, Reenactment**		
1	14.00-16.00	Rūtilė Pukienė, Irutė Kaminskaitė, the Museum guide		Tour of the National museum – Palace of the Grand Dukes of Lithuania specialized in wooden heritage
16.00-16.30		Coffee break		
2	16.30-17.10	**Algirdas**	**Juškevičius**	Reenactment of ancient woodenware. Practical aspects (demonstration)
3	17.10-17.30	**Kęstutis**	**Peseckas**	Demonstration: Wood working at Šventoji Bronze Age river
	17.30-18.00	Discussion		

4th September, Monday

II Practical session with a special guide Rasa Bertašiūtė	**Wood and woodworking at the ethnographic Open Air Museum of Lithuania at Rumšiškės**
9.00-10.30	Departure from Vilnius, arrival at the Open Air Museum
10.30-11.00	Coffee break at the Education class
11.00-13.30	Architecture of homesteads from three ethnographic regions of Lithuania. Manor house - the Wooden Built Heritage Conservation, Research and Training Center. Museum depository of old tools and/or Exile sector.
13.30-14.30	Traditional lunch at the 'Tavern' or 'Tearoom'
14.30-16.00	Practical education: building a regional type log house, shingle production
16.00-17.00	Coffee break, discussion
17.00-18.00	Architecture of a homestead from Samogitia region
18.00-19.30	Departure from Rumšiškės, arrival at Vilnius

5th September, Tuesday

		II Session of oral presentations		**Woodworking in historical times**
9	9.00-9.20	**Antonio**	**Frattari**	Use of the Wood in the Buildings Refurbishment: Case Study the Reclamation of a Rural Building in Trentino Region (Italy)
10	9.20-9.40	**Veronika**	**Kotradyova**	Archetypes and Stereotypes connected with wood
11	9.40-9.55	**Konrad**	**Mayer**	Workability of different wood species: Are there connections to other wood characteristics?
12	9.55-10.10	**Jelte**	**van der Laan**	Out of the woods, development of the archaeological wood database WOODAN
13	10.10-10.30	**Rūtilė**	**Pukienė**	What the wood of the 14-17 Cs. combs and mirror frames tells
		Irutė	**Kaminskaitė**	
10.30-11.00		Coffee break		
14	11.00-11.10	**Michael**	**Grabner**	Tool marks - a case study from Styria
15	11.10-11.30	**Sarah**	**Cremer**	Methods for recording wood working traces in roof frames and first results from the study of thirty roofs in the Brussels region (Belgium)
16	11.30-11.40	**Elisabeth**	**Wächter**	Assembly marks in roof constructions at the Waldviertel region
17	11.40-11.50	**Michael**	**Grabner**	How long was timber dried
18	11.50-12.10	**Sebastian**	**Nemestothy**	Safeguarding handicraft knowledge with the help of filming - Shingle production
	12.10-12.30	Discussion		
12.30-14.00		Lunch at the cafe of the Vilnius University, Universiteto str. 4.		
III Practical session			**Tour of the State cultural reserve of Kernavė with the demonstration of ancient birch bark decoration technique**	
14.00		Departure		
15.00-17.00		Activities at the Kernavė reserve, coffee break in between		
18.00		Arrival at Vilnius		
19.00-21.00		Farewell dinner at the cafe of the Vilnius University, Universiteto 4.		

6th September, Wednesday

7:00	Departure for Tartu, Eurodendro-2017
-	Departure for other destinations

ABSTRACTS

Questions of Woodworking - from Pile Dwellings to pre-Modern Architecture

Katarina Čufar[1]*, Anton Velušček[2], Luka Krže[1], Aleš Straže[1], Maks Merela[1]

[1] University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology, Ljubljana, Slovenia

[2] Research Centre of Slovenian Academy of Science and Arts, Institute of archaeology, Ljubljana, Slovenia

*Correspondence: Katarina.cufar@bf.uni-lj.si

Key words: archaeological waterlogged wood, historical wood, constructions, violins

We will present some typical objects made of wood in various periods and discuss their characteristics, which reflect practices of wood selection and processing. The oldest objects were preserved in waterlogged condition and originate from prehistoric pile dwellings at the Ljubljansko barje, Slovenia, which lived in the 4th millennium BC. Besides thousands of piles, we investigated some valuable wooden objects like the ca. 5600 years old bow made of yew wood and the ca. 5150 years old wheel with axle made of ash and oak, as well as two log boats made of oak wood. All objects showed that the pile dwellers knew how to properly select, process and use the wood.

Approximately 2000 years old river boats have also been preserved under water or in wet soil. Among them is a river barge made of beech wood with dendrochronologically defined end date 3 AD. Besides unusual wood selection (beech) it also showed unique construction where the planks were connected with iron clamps. From nearly the same period originate wooden barrels used for water well constructions made of silver fir and Norway spruce.

Timber from historical buildings, including castles and various rural buildings is rarely older than 500 years. It reflects different approaches of wood supply and use over time. Finally, we will present some new findings regarding wood use for violins. We will discuss the potentials and limitations of dendrochronology to obtain information on wood processing and use.

Neolithic wood working in north-eastern France

Bernhard Muigg[1]*, Willy Tegel[2]

[1] Institute of Forest Sciences, Chair of Forest History, Albert-Ludwigs-University Freiburg, Germany

[2] Institute of Forest Sciences, Chair of Forest Growth and Dendroecology, Albert-Ludwigs-University Freiburg, Germany.

*Correspondence: bernhard.muigg@wfg.uni-freiburg.de

Key words: Dendroarchaeology, neolithic, wood working, water well, palisade

The consistent implementation of preventive Archaeology in north-eastern France over the last two decades delivered large quantities of wooden finds from all archaeological epochs. For the neolithic period, dendroarchaeological analyses on various structures contribute greatly to new insights of archaeological research. Recent studies on the 5th to 3rd millennium deliver dendroarchaeological data from middle neolithic times to the transition period to early Bronze Age. Three exemplary case studies from north-eastern France are presented to display the level of wood working technology concerning structures of water supply. Water well linings from Dambach, Erstein and Marckolsheim (all Alsace) show very similar designs, consisting of hollowed out trunks.

Apart from wells, a new find of a palisade from around 3300 BC in La Villeneuve-au-Châtelot, Champagne, is outstanding. Though the excavation works are not finished yet, first dendroarchaeological analyses allow a first glimpse on the wooden remains. The excellent preservation of the wooden objects makes it possible to understand certain process steps. Tangentially splint planks from large oak trees with diameters up to 100 cm show a new dimension of contemporary wood working. The common ideas on wood working for the period of the 4th millennium BC are strongly influenced by finds from pile dwellings around the alps. The palisade from Villeneuve reveals a very different picture of woodworking skills from the same period.

Wooden artefacts in the Netherlands from prehistoric times until AD 1300

Silke Lange

[1] Archaeologist and wood specialist at BIAX Consult, Symon Spiersweg 7 D2, 1506 RZ Zaandam, Netherlands.

Correspondence: lange@biax.nl

Keywords: Wetlands, domestic wooden artefacts, wooden utensils, woodworking, use of different wood species, resource management.

The presentation shows the results of the project `Synthetic Archaeological Research Wooden Artefacts', which falls under `Harvest for Malta Research'. Since the introduction of the convention of Valletta (Malta), over fifteen hundred domestic wooden artefacts from all periods from the Mesolithic to 1300 AD have been excavated. The diversity in wooden implements immediately becomes clear. The spectrum for the Mesolithic and Neolithic includes paddles, fish traps, spears, lances, bows and axe handles. In the Metal Ages we also find artefacts used in and around the house, such as bowls and cups for food preparation and climbing tools for well construction and maintenance. Ploughshares from the Iron Age attest to working of the soil and arable farming. In the Roman period, the influence of incorporation in the Empire becomes clearly visible in the range of wooden tools. Furthermore, the Roman style was appreciated elsewhere too, as evidenced by finds of wooden utensils of Roman manufacture in indigenous settlements. The range of domestic wooden artefacts from the early Middle Ages reflects the intensification of supra-regional contacts with trade in wood and/or wooden products. With the rise of towns, the variation in wooden artefacts increases and new categories are introduced, such as wooden toys and pattens. The study of wooden implements gives a glimpse of the importance of wood until 1300 AD and later.

Can construction tell us anything about the constructor?

A typology of ancient wells in Bavaria

Julia Weidemüller [1]*

[1]Department of Geography, University of Bonn

*Correspondence: julia.weidemueller@gmx.de

Key words: typology, time series, relative and absolute chronologies, hydraulic construction

The erection of hydraulic constructions like wells often depends on its use. Usually, the whole construction is aligned to existing circumstances such as the condition of the soil or the accessible building materials. My research project in the Lower Isar Valley in Southern Bavaria studies, whether these construction techniques are also influenced by cultural aspects and allow scholars to draw conclusions about the constructors and whether a compilation of relative chronologies is possible. By means of data gathered from tree rings, these relative chronologies can subsequently be transformed into absolute chronologies.

Several dozen wells in a clearly defined area, the Lower Isar Valley, have been studied and analyzed in terms of construction technique, well depth, used materials, usage of freshly felled or matured logs, repairs, and period of usage. The analyses are used to identify and compare regularities and differences between the wells. The examined wells date back to the Early Middle Ages, and were built approx. between 500 and 1200 CE. The project aims to develop a typology, which will enable cultural and chronological classifications based on the aforementioned features of the constructions.

In my talk, I will introduce the typology developed during my research. To illustrate its applicability, I will additionally present some of the data gathered in the Lower Isar Valley.

Using branch age and diameter to identify woodland management: new developments

Caroline Vermeeren[1]*, Kirsti Hänninen[1], Welmoed Out[2], Jannie Larssen[2]

[1] BIAX *Consult*, the Netherlands

[2] Moesgaard Museum, Denmark

*Correspondence: vermeeren@biax.nl

Key words: wood management, coppicing and pollarding, age/diameter analysis, growth rings

There is no doubt that people have used woodlands in the past. Examples are hunting, foraging and gathering of wood resources. One way to increase the quantity and quality of the available wood is management of trees. Managed trees tend to produce long, straight branches in a short time. In an attempt to prove utilization of managed trees a method was developed using the age/diameter ratio. The fast growth of branches from managed trees result in fewer year rings for a given diameter, when compared to branches from unmanaged trees. During the Hallstatt meeting in 2015 we presented results from research on both managed and unmanaged modern day willow, alder and ash (the taxa most used for archaeological wicker work in the Netherlands), supplemented by hazel (often used in Denmark). The results seemed to confirm our hypothesis. New research focused on other factors influencing growth, like light, nutrition, length of management cycle and growth patterns of seedlings. Birch is a new taxon in the research. Recommendations for archaeological sampling will be given.

Out, W.A., C. Vermeeren & K. Hänninen 2013: Branch age and diameter: useful criteria for recognizing woodland management in present and past? Journal of Archaeological Science 40, 4083-4097.

Out, W.A., K. Hänninen & C. Vermeeren 2017: Using branch age and diameter to identify woodland management: new developments, Environmental Archaeology. (in press)

Different kinds of 'under-water-fences' in the Baltic from various periods

Claudia Baittinger[1]*

[1] National Museum of Denmark, Environmental Archaeology and Materials Science

*Correspondence: Claudia.baittinger@natmus.dk

Key words: Woodland management, wickerwork fences, Iron Age, fishing weir, Middle to Late Neolithic

Waterlogged wood from two different prehistoric sites on the Island of Lolland in Southern Denmark from ca. 3100 - 2300 BC and the early 1st century AD has been studied.
In both cases there has been a tradition of weaving fences with the help of twigs and branches and put them under water. Is there is any trace of woodland management connected to this activity?

Museum Lolland-Falster is currently conducting archaeological excavations at Rødbyhavn ahead of the construction of the permanent link to Germany. Given the size of the area that is to be explored, there will be opportunities to study an entire Stone Age landscape.
Studies of fishing fences from different localities have shown that mainly hazel (*Corylus avellana*) was used for the wickerwork, but also ash and about five other deciduous tree species were found. In one of the fishing fences the horizontal material was mostly made of lime (*Tilia* sp.).
Everything points to the fact that the fishing weirs have been located by the coast in shallow water leading the fishes towards the trap or basket. This form of fishery is known throughout the most of prehistory and right up until around the 1900s, where the fences and the traps however were made of tarred nets rather than wickerwork.
The facilities require, among other things, access to large quantities of wood, mostly twigs and branches, of the right quality, which could point to some kind of woodland management.

Hoby on Lolland is a chieftains' residence from the early 1st century AD (Iron age). It comprises more than 40 buildings and unique evidence for ritual activity. The 'ritual area' is composed of two large artificial lakes, cooking pits and deposits of animal bones. A hitherto unknown phenomenon is that parts of one of the lakes were separated off by several wickerwork fences, while in the middle a wooden platform of unknown purpose had been erected.
Mostly ash (*Fraxinus excelsior*) has been used for the wickerwork fences, as well as branches and twigs from ten other deciduous tree species.

Archaeological excavations have been conducted by Museum Lolland Falster and the National Museum of Denmark.

Wood working at Šventoji Bronze Age river

Kęstutis Peseckas

Correspondence: kestas@utgardas.lt

Key words: archaeological wood, woodworking, wood species, toolmarks, fishing weir, Šventoji.

Šventoji archaeological complex was discovered in 1970s and since then extensively excavated by various archaeologists, mostly by R. Rimantienė. During this time lots of wooden archaeological artefacts (mostly associated with fishing) were found in waterlogged sapropel layers dating to Subneolithic – Neolithic periods and in sediments of Bronze Age rivers, that formed when water level fell in Šventoji lagoonal lake.

During the excavations in 2015 a new site was discovered in Šventoji archaeological complex. A wooden construction made of vertical and horizontal piles and logs of various length and diameter was unearthed in 70 m^2 trench. It seems most likely that this construction was used as a fishing fence somewhere around 1500 cal BC. Around 100 wooden finds from this newly discovered site allows us to make some assumptions about the woodland management strategies adopted by Šventoji Bronze Age fishers.

Analysis of age and diameter of wood used in making the fishing construction makes us think that material for its construction was collected opportunistically from not managed woodland. Species analysis showed that different wood was chosen for vertical and horizontal constructional elements. Moreover seeking to understand whether stone or metal tools were used in shaping the ends of vertical piles an experimental study and was conducted using replicas of Bronze Age axes.

Ergersheim Experiments 2011 – 2017

Wulf Hein[1*], Rengert Elburg[2**], Anja Probst[3]

[1] Archäo-Technik

[2] Flintsource.net

[3] freelance archaeologist

*Correspondence: info@archaeo-technik.de

**Correspondence: elburg@flintsource.net

Key words: Experimental archaeology, Stone Age woodworking, Stone Age axes and adzes, wedges and chisels

For the last seven years a team of enthusiasts around the authors met in an oak forest near Würzburg (Bavaria, Southern Germany) annually to test prehistoric woodworking tools. Numerous experiments were carried out in order to collect first-hand information about suitability, handling and performance of various kinds of axes, adzes, chisels and wedges not only made from stone but also from antler, bone and wood. A lot of data were recorded concerning handling, working time, use wear traces on tools and tool marks on processed wooden workpieces, not only the cut marks on the tree stumps but also traces on planed boards to compare them with constructive elements of original finds like the early Neolithic wells discovered in Germany. For the 3D-documentation we used reflectorless tachymeter, photographic software such as “structure from motion” and 3D-scanners. Moreover, we also kept representative samples of all types of chips and shavings to be able to compare them to archaeological finds at excavations.

After having worked with “primitive” tools for such a long time, we are in every aspect fascinated by their performance. We presume that based on our practical experiences we can make fairly reliable estimates about their use, advantages and drawbacks. But most notably we are able by now to shed new light on a couple of theories concerning Stone Age woodworking in general and the suitability of specific tools and techniques, and this will be the essence of our paper.

Use of the Wood in the Buildings Refurbishment: Case Study the Reclamation of a Rural Building in Trentino Region (Italy)

Prof. Antonio Frattari[1*], Dott. Arianna Cescatti[1]

[1] University of Trento – Italy

*Correspondence: antonio.frattari@unitn.it

Keywords: Wooden Building, Reclamation, Accommodating Buildings, NZEB

The reuse and refurbishment of existing buildings represents, for the future, one of the most important sustainable approaches in the construction industry, considered one of the most responsible for the environmental crisis affecting our planet. The use of wood, a natural and renewable material, is a correct answer to this problem. The sawed wood helps to reduce the greenhouse effect because it incorporates forever in 1 m^3 of wood 1,01 ton of CO2. The culture of using wood is not yet part of the Italian housing recovering process.

The Laboratory of Building Design at the University of Trento has developed an exemplary case study to promote the wood culture. It consists in the reclamation of an old barn converted into an accommodating building. The adopted constructive solution introduces the use of CLT panels in order to realise an envelope inside the existing building according to the theory developed in 2002 by Prof. Antonio Frattari concerning the concept of “Envelop Within an Envelope”. To increase the environmental sustainability particular attention has been paid to the exploitation of the free energy contributions from the building surrounding and to increase the energy characterization of the envelope in order to realise a NZEB.

Archetypes and Stereotypes connected with wood

Veronika Kotradyova,[1]*, Juraj Podoba [2],

[1] Slovak University of Technology, Faculty of Architecture, Námestie Slobody 19, 812 45 Bratislava, Slovakia

[2] Comenius University, Faculty of Social and Economic Sciencies, Mlynské luhy 4, 821 05 Bratislava, Slovakia

*Correspondence: *kotradyova@fa.stuba.sk

Key words: wood, archetypes, stereotypes, instincts, culture

Wood is a material that helped Homo sapiens to survive and our nervous system knows and recognizes it very well. It reminds survival and thus whole body can release, weather in form of live tree or in built-in joinery product. This inclination is particularly present by old wood structures and surfaces.

Thanks to its local availability it is part of our material culture with its stereotypes and archetypes, thus the inclination of human beings to wood has instinctive as well as socio – cultural background, especially in the countries with naturally high level of forestation. Even if natural wood and other growth materials are temporarily displaced by a variety of news from material engineering, but the material and building culture always gets back to them, because they represent timelessness. The more technical improvements, imitations and agglomerated hybrids or substitutions are offered by market and industry, the more it is necessary to speak about authenticity and its importance.

Wood like material, its structures and surface itself are connected with number of archetypes and stereotypes that will be briefly analyzed in the presentation, such us its authenticity, durability, behavior of wood structures in fire and hygienic performance. Paper presents also mechanisms and origins of archetypes and stereotypes. It is necessary to find reasons and arguments especially form the successful experiences from historical wood and to include into the enlightenment about wood.

Workability of different wood species:

Are there connections to other wood characteristics?

Konrad Mayer[1]*, Michael Grabner[1]

[1] University of Natural Resources and Life Sciences – BOKU, Vienna, Austria; Konrad Lorenz Strasse 24, 3430 Tulln, Austria

*Correspondence: konrad.mayer@boku.ac.at

Key words: workability, wood properties, wood characteristics, handicraft

Workability is a rather complex parameter, as its evaluation is heavily linked to the techniques used in traditional crafts as well as to the certain products. Workability of wood can therefore be understood as the material performance while splitting, planing, carving, turning or other woodworking techniques as well as the characteristics of the final product after processing. However, historic literature is giving few, but quite indistinct information about various species' workability. This makes a vague assignment to different classes possible, describing some particulars of this parameter, but the causes of the species' differences in workability remain unclear.

By explorative data analysis of various wood characteristics we sought for potential explanations of differences in workability. However, data of eleven parameters as well as information about fiber length and coarseness from historic literature couldn't explain variation in workability, turnability, the quality of split surfaces as well as the suitability for planing or carving. Only density seems to be the cause for differences in the needed force to split various wood species. Workability as a complex material characteristic is likely to be assessed in well-defined applications (case studies) as well with multivariate methods only.

Out of the woods, development of the archaeological wood database WOODAN

Jelte van der Laan[1]* & Stephan Nicolaij[2]

[1] Cambium Botany, Friesestraatweg 175, 9743 AB Groningen (The Netherlands).

[2] Qursi Software, Friesestraatweg 175, 9743 AB Groningen (The Netherlands).

*Correspondence: info@woodan.nl

Key words: Wood utilization, Archeology, Database system

Over the last decades universities, government institutions and commercial companies have collected a huge amount of information on archaeological wood finds. The need for a platform, where this data can be centrally accessed, has been emphasized for several years. Since 2013 we have been working on an online platform were archeological wood from Dutch sites can be registered and found in a database-driven website (www.woodan.nl).

Databases are an indispensable tool in modern day research. Although the Dutch government provides in a system in which archeological research is registered, it takes very much time to collect data about individual finds. Besides, until recent research (SL), no overview of wood finds in The Netherlands was available in contradiction to, for example seeds, pottery or metal finds.

With WOODAN we try to provide in a web-based database in which one can easily search and access all the data on archaeological wood finds. WOODAN employs different search strategies, which we would like to show in a short presentation. Our goal is to implement an free, international database and are looking for enthusiastic partners.

What the wood of the 14-17 Cs. combs and mirror frames tells

Rūtilė Pukienė[1*], Irutė Kaminskaitė[1**]

[1] National Museum – Palace of the Grand Dukes of Lithuania; Katedros sq. 4, LT-01143 Vilnius, Lithuania

Correspondence: * r.pukiene@valdovurumai.lt; ** i.kaminskaitė@valdovurumai.lt

Key words: late medieval, archaeobotany, history of hygiene, European trade of wood, wood processing

The cultural layer of the Vilnius Lower Castle territory has been accumulating since the 13th century and is 8 meters thick in deepest places. The waterlogged late medieval layers are rich with preserved organic artifacts and wooden infrastructure objects.

Over 3000 wooden or such composite artifacts were found while investigating the territory of Vilnius Lower Castle. During the investigation 23 combs and 17 mirror frames representing the 14th - 16th centuries were found.

The majority of combs are made of boxwood (*Buxus sempervirens* L.) but two items made of *Rosaceae* (subtribe *Malinae*) were also determined by the wood anatomy analysis. The combs are rather uniform, double-sided, rectangular with lentoid profile and quite simply decorated.

The mirror frames are round-shaped with a round socket for a reflecting plate. The majority of frames are turned from softwood planks. One frame is made of pine (*Pinus sylvestris* L.), two – of spruce (*Picea abies* (L.) H. Karst.) and three – from the wood of fir (*Abies alba* Mill.), which is not native in Lithuania. One mirror frame had two sockets on opposite surfaces and was made of a cross-section of lime (*Tilia* sp.) round-wood. This frame was decorated with carbon-black triangles. No traces of reflecting plates were found in any case but adhesive paste made of chalk and animal glue was detected in three frames. Fragments of tin used for decoration and also for undefined purpose were found.

The specific production technology and the selection of material indicate that combs and mirror frames could be imported. The possible location of mirror production could be expected in an area where the ranges of fir and spruce overlap.

Tool marks – A case study from Styria.

Michael Grabner[1]*, Sebastian Nemestothy[1]

[1] University of Natural Resources and Life Sciences – BOKU, Vienna, Austria; Konrad Lorenz Strasse 24, 3430 Tulln, Austria

*Correspondence: michael.grabner@boku.ac.at

Key words: wooden building, historical wood utilization, tool marks, wood machining

Each step of wood processing keeps information of the kind of tools used.

A granary from Oberzeiring (Styria, Austria), now situated in the Austrian Open Air Museum Stuebing, dated to 1724 was studied in detail. The thickness of the wooden wall was about 12 cm. The height (width) of these timbers was more than 50 cm. Producing such “boards” by hewing with the broad axe would end in a very low outcome – as it is only possible to produce a single “board” per log.

Traces of a saw were found at knots at the inner surfaces of the walls while at the main wooden surface traces of planing were detected. As the knots shrink more during drying compared to the usual wood, the following hypothesis can be stated: Sawing was done under fresh conditions, drying of the boards and planing afterwards (making the storage within the granary easier).

During the inspection of the outer surface of the walls, clear signs of hewing with the broad axe were detected. Putting all information together, following steps of wood processing can be stated:

a) hewing with the broad axe to squared timber
b) cutting with the help of a saw into two boards
c) drying
d) planing

Following this kind of processing the outcome can be doubled.

Methods for recording wood working traces in roof frames and first results from the study of thirty roofs in the Brussels region (Belgium)

Crémer Sarah[1*], Fraiture Pascale[1], Hoffsummer Patrick[2], Modrie Sylviane[3], Weitz Armelle[1], Maggi Christophe[1], Charruadas Paulo[4], Sosnowska Philippe[4], Gautier Patrice[5]

[1] Royal Institute for Cultural Heritage, Brussels (Belgium)

[2] Université de Liège (Belgium)

[3] Regional Public Service of Brussels (Belgium)

[4] Université libre de Bruxelles (Belgium)

[5] Royal Museums of Art and History, Brussels (Belgium)

*Correspondence: sarah.cremer@kikirpa.be

Key words: wood working techniques, dendrochronology, roof frames, 12th-19th centuries, Brussels

In the frame of the project “Typological and dendrochronological inventory of ancient roof frames in the Brussels region” financed since 2013 by the Regional Public Service of Brussels, we have studied the wood working traces in 32 roof frames selected for their archaeological interest. This approach is based on the systematic recording of different features to better understand how the carpenter designed and made his work. Thanks to dendrochronological dating, it also allows for the reconstruction of the evolution of the construction of the roof frames in a given region, and the skills of the craftsmen.

In situ, the composition of the roof frame, of the truss and of the bracing is detailed. The traces of supplying and of manufacturing of the beams are recorded on each accessible piece of wood (merchant marks, tool traces…). Assembly marks and joins are described. These observations are mainly done with a raking light and some features are recorded with a 1/1 scale by rubbed tracings. All these recordings are then drawn on an archaeological survey and uploaded in a database for comparisons between structures and sites, and to filter data with specific fields. Species identifications and dendrochronological dates are also added in the database, these two kinds of information being essential for the study and the reconstruction of the wood working techniques.

Assembly marks in roof constructions at the Waldviertel region

Elisabeth Wächter[1]*, Sebastian Nemestothy[1], Michael Grabner[1]

[1] University of Natural Resources and Life Sciences – BOKU, Vienna, Austria; Konrad Lorenz Strasse 24, 3430 Tulln, Austria

*Correspondence: elisabeth.waechter@boku.ac.at

Key words: carpentry, construction signs, typology, Waldviertel

The region of the Waldviertel is located in the north - west of Lower Austria. The area is surrounded by the Czech Republic in the north and the Danube in the south. The border to Upper Austria is in the west and the Manhartsberg forms the eastern boundary.

The analysis of 43 churches, a castle and 10 secular buildings in the Waldviertel region lead to an overview of the roof structures in different epochs resulting in a typology from the Middle Ages to 1900.

Prefabrication of wooden roof constructions was the established method to build roof structures. The individual components of the roof truss were cut to length, the joints sawn and mortised, and a numbering or marking was applied. This process was carried out either at an area next to the construction site, or if only limited space was available, further away, for example outside the city wall. All parts were reassembled when the truss was erected.

Throughout an investigation in the Waldviertel, signs written with red chalk, engraved in the wood, or chopped as identification marks of the construction units and their individual parts were identified and analyzed. It was possible to give an overview on the assembly marks in the Waldviertel region.

How long was timber dried?

Michael Grabner[1]*, Andrea Weber[1], Sebastian Nemestothy[1]

[1] University of Natural Resources and Life Sciences – BOKU, Vienna, Austria; Konrad Lorenz Strasse 24, 3430 Tulln, Austria

*Correspondence: michael.grabner@boku.ac.at

Key words: wood drying, historical wood utilization, dendrochronology

Wood-working includes many different crafts, each having its own rules and traditions. In the present study the Austrian traditions in relation to wood drying are illuminated with the help of dendrochronology.

Furniture from three Austrian museums has been analysed. 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.

A difference of just some years (tree rings) between the denrochronological date of the outermost ring (no waney edge) and the painted date made it clear, that loss of wood due to machining and drying time was avoided an kept at a minimum. The lowest difference was 2, 4 and 8 years (average 14 years).

Statements about seasoning times found in literature are rather diverse. Ille (1975) mentions 50 years storage time for the wood of violins. Beuting (2011), however, examined tree rings of famous violins and found a maximum period of three years. Our findings follow the old general rule of 1 year per cm thickness of the boards.

What was the seasoning time of construction timber?

Round wood (logs) has always been treated in wet condition – whether for hewing or sawing beams or squares. The joining of roof trusses took place (and still does today) at the lofting floor in the area next to the construction site. Here, the parts were cut to length, the connections were sawn and morticed, as well as the numbering signs were assigned. Thus, all the associated parts could be rejoined when the roof construction was erected later.

Numbering signs which were separated by drying cracks made it clear, that next to the hewing, the joining (including the numbering) took place under wet conditions.

Safeguarding handicraft knowledge with the help of filming

- Shingle production

Sebastian Nemestothy[1]*, Michael Grabner[1], Hischam Momen[2], Klaus Seelos[3]

[1] University of Natural Resources and Life Sciences – BOKU, Vienna, Austria; Konrad Lorenz Strasse 24, 3430 Tulln, Austria

[2] Natural History Museum Vienna, Burgring 7, 1010 Wien, Austria

[3] Austrian Open Air Museum Stuebing, 8114 Stübing, Austria

*Correspondence: sebastian.nemestothy@boku.ac.at

Key words: immaterial heritage, handicraft, documentary film, wooden shingles

In former times wood as a raw material in building constructions has been indispensable. It was used in various forms like beams and boards for walls, floorings and roof constructions, but also in smaller pieces like nails and for example roof shingles. The importance of providing a dry shelter for men and livestock is obvious and likewise important for valuable goods like food, grain and seeds. Over the time regional variances in roofing have been developed: thatched and wooden roofs as well as stone materials like slated and later tiled roofs were common. Even within these categories there are various styles, in Austria there are several types of wooden roofings known: simple board roofs “Bretterdächer”, shingles weighted with stones “Legschindeln”, shingles with a tongue and groove joint “Nutschindeln”, larch shingles with a simple layout “Scharschindeln” and spruce shingles laid out in a crisscross pattern, so called “Schieferschindeln”.

All these types have in common that a careful selection of the raw material is necessary. Trees with a straight, knotless, even growth are desired to provide good workability and later satisfying durability on the finished roofing. The second crucial factor is the knowledge and skill of the craftsman, an immaterial cultural property. Which parts of the log have to be dismissed, which parts are being used? Which tools are needed and how are they used? How is cleaving done most easily and also sustainable? All the answers are self-evident for an experienced craftsman and have most likely been taught to him by another craftsman during his years of apprenticeship. However various crafts are getting scarcer or have even vanished years ago in the cultural landscape of most European countries, at latest since the industrial revolution. Therefore steps have to be taken to safeguard traditional knowledge not documented in pen and paper – often simply because there was no need or no way to describe processes in a proper way. One opportunity are documentary films which provide a step by step guide on reproducing the knowledge of craftsmen. In these films all the factors for a finished product have to be condensed by using modern film production technology and techniques. A pioneering project was set up with the support of the International Wood Culture Society, describing in sound and vision the successful way to a “Schieferschindel” - roofing. Thereby it will be possible to not only store, but also rediscover forgotten knowledge by future generations.

LIST OF PARTICIPANTS

Last Name	First Name	Country	Affiliation	e-mail Address
Baittinger	Claudia	Denmark	National Museum of Denmark,	Claudia.baittinger@natmus.dk
Bertašiūtė	Rasa	Lithuania	Open Air Museum of Lithuania	rasaberta@gmail.com
Cremer	Sarah	Belgium	Royal Institute for Cultural Heritage	sarah.cremer@kikirpa.be
Čufar	Katarina	Slovenia	University of Ljubljana, Biotechnical Faculty	Katarina.cufar@bf.uni-lj.si
Frattari	Antonio	Italy	Universita' di Trento	antonio.frattari@unitn.it
Grabner	Michael	Austria	University of Natural Resources and Life Sciences - BOKU, Vienna	michael.grabner@boku.ac.at
Hein	Wulf	Germany	Archäo-Technik	info@archaeo-technik.de
Juškevičius	Algirdas	Lithuania	Varėna Centre for Culture	algirdasjusk@gmail.com
Kalela Brundin	Maarit	Sweden		maaritkalelabrundin@gmail.com
Kaminskaitė	Irutė	Lithuania	National Museum – Palace of the Grand Dukes of Lithuania	i.kaminskaitė@valdovurumai.lt
Kotradyova	Veronika	Slovakia	Slovak University of Technology, Faculty of Architecture	kotradyova@fa.stuba.sk
Lange	Silke	The Netherlands	BIAX Consult	lange@biax.nl
Mayer	Konrad	Austria	University of Natural Resources and Life Sciences - BOKU, Vienna	konrad.mayer@boku.ac.at
Muigg	Bernhard	Germany	Institute of Forest Sciences, Chair of Forest History, Albert-Ludwigs-University Freiburg	bernhard.muigg@wfg.uni-freiburg.de
Nemestothy	Sebastian	Austria	University of Natural Resources and Life Sciences - BOKU, Vienna	sebastian.nemestothy@boku.ac.at
Peseckas	Kęstutis	Lithuania		kestas@utgardas.lt
Pukienė	Rūtilė	Lithuania	National Museum – Palace of the Grand Dukes of Lithuania	r.pukiene@valdovurumai.lt
van der Laan	Jelte	The Netherlands	Cambium Botany,	info@woodan.nl
Nicolaij	Stephan	The Netherlands	Qursi Software	
Vermeeren	Caroline	The Netherlands	BIAX Consult	vermeeren@biax.nl
Wächter	Elisabeth	Austria	University of Natural Resources and Life Sciences - BOKU, Vienna	elisabeth.waechter@boku.ac.at
Weidemüller	Julia	Germany	Department of Geography, University of Bonn	julia.weidemueller@gmx.de