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# Woods(') matter(s)

## Bridging craft knowledge and wood science to highlight diversity and complexity

*Keywords:* wood science and craftsmanship; temporalities; functionality and aesthetics; ecology; matters and meanings.

### ABSTRACT

Wood combines important uses in crafts and human-wood relations, with very high bio-diversity and physical complexity. Yet wood science and craftsmanship are seldom connected. I argue for decompartmentalising these forms of wood knowledge, and propose methodologies and questions transversal to wood and crafts: temporalities; functionality and aesthetics; ecology; and matters and meanings. This is illustrated by two recent research. One focuses on the different dimensions of time, in wood physics, forestry, and crafts. It highlights wood as a recorder of time – probably more than any other material – and temporalities as essence of craft work and craftsmanship. Another explores the four questions above through guitar-makers' woods. It exemplifies the imbrication of functionality and aesthetics in craftspersons' relation with wood, and topical issues of diversification and sustainability.

### INTRODUCTION

Wood has accompanied humankind throughout history. As material, wood is both complex—due to its multi-scale structure and multi-physical behaviour—and highly diverse, with about 60,000 tree species identified (BGCI, 2021). Understanding wood matter and uses requires to consider diversity, complexity, together with the deep human-wood relation developed over time. But there is still a lack of links between wood material science and the analysis of human-wood relation, as between scientific research and the important experiential knowledge of woodworking craftspersons. Wood science (<2 centuries), spans over classical disciplines (Mai et al., 2022). But, as for other sciences, its applications to human uses of wood often serve industrial production, which narrows focus on a supposed utilitarian goal, and on limited diversity. While craft uses of wood combine physical-mechanical, aesthetical, environmental and cultural parameters, and concern higher diversity. For example, wood used in crafts for daily life only a century ago in Austria came from twice more numerous species, with much wider ranges in properties, than those commercialised today (Grabner, 2017; Klein et al., 2016). Or, research on instrument-making wood has concentrated on spruces' "acoustical" properties, more than on all other wood features, and all other species and cultures in the world (Brémaud, 2012). Conversely, taking into account wood science knowledge would help finer interpretations in craft sciences. Among books on craft, works concerning specifically wood-related crafts, e.g. (Dudley, 2014; Marchand, 2021; Pye, 1968; Schwint, 2002) are well represented in the notions of practice-based building of knowledge, of the relation with materials, and/or of meaningful work, e.g. (Ingold, 2017; Sennett, 2010; Smith, 2004). Bridging the gap between wood material science, craftspersons knowledge and craft sciences analyses could be mutually beneficial, e.g. (Cabrolier & Brémaud, 2014). Here, I propose some dedicated transdisciplinary methodology and questions, illustrated by two case studies of recent research.

## PROPOSITION OF A METHODOLOGICAL “LOOP”

To bridge wood craftsmanship and science, I have formalised a transdisciplinary research loop (Brémaud, 2016). This loop starts (1) with surveys and interviews into the issues and knowledge of woodcrafts practitioners; then (2) seeks to identify underlying physical phenomena; and (3) explores the diversity of woods and the sources of variation in their properties/qualities; then (4) takes into account the woodcraft processes, as “filters” between the material and its perception; and finally (5) “closes the loop” with sensory perception analyses, to compare human representations and measurable characteristics. General requirements for this methodology are, obviously to establish respectful and mutual relation between craft and academic actors, to know the different specific vocabularies to be able to “translate” questions between the different experts and steps of research, and to carefully plan samplings including both inter-specific diversity and intra-specific variability, focusing on wood qualified by experts of craft and on “lesser-studied” forest species. Each step calls for specific, detailed requirements. The global loop may be applied for different cases of study.

## QUESTIONS AT THE INTERFACE OF WOODCRAFTS AND WOOD SCIENCES

I propose four broad questions that are particularly transversal to the specificities of wood and of crafts.

### **Temporalities: what are the relations to time, in wood rheology, forestry or craft?**

Crafts combine historical time, the time of learning and experience, the rhythms of work and the sequence of the “chaîne opératoire”, and the perceived time. Biological and environmental time are inscribed in the wood of the tree. Physical time governs the mechanical behaviour of the wood material. This raises fundamental questions on the interplay between wood and craft, and is slightly further detailed on the first illustrative case study below (Brémaud et al., 2023).

### **Functionality and aesthetics: craft-culture, trade-offs or wood indicators?**

A first part is to analyse the trade-offs and/or correlations between physical and aesthetical criteria of wood selection in crafts. As the figure of wood reflects its structure and its colour reflects its chemistry, both are susceptible to affect both aesthetics and physical functions. Some ways of wood selections in craft may be based on visual sense yet inform physical-mechanical properties/qualities (Carlier et al., 2018). Conversely, some discourses may put forward the “functionality” but in fact reveal aesthetic expectations (Brémaud, 2025b). Yet, beyond this still rather materialistic viewpoint, future research may include a more cultural vision by integrating all three directions of the “beauty of gesture – functional beauty – beauty of material” triangle, which is essential in crafts.

### **Ecology: Woodcrafts as a way of revealing relationships with the environment?**

Here hypotheses are to be tested on the degree of closeness to the plant kingdom (depending on either rural or urban settings of contemporary crafts), but also on craft knowledge (either past or present) as revealing “secondary” or “lesser-known” forest species bearing woods with atypical material properties (Klein et al., 2016). In the current biodiversity crisis, we also need to question the respective contributions of properties, historical pathways, representations and preferences, in underlying sustainable or non-sustainable uses (Brémaud, 2025b; Gibson, 2019; Lichtenberg et al., 2025).

### **Matters and meanings: Bridging wood science with an anthropology and philosophy of craft?**

One aspect is connecting “Materiality” in the sense of the human and social sciences, with an effective approach into materials science. Conversely, we shall re-contextualise research into wood material

science in the light of the complexity of the issues and practices involved in craft. It seems vital to bridge wood research to the anthropology and philosophy of craftsmanship, because there are similarities between the researcher's work and the craftspeople's work (Ingold, 2017; Pye, 1968; Schwint, 2002; Sennett, 2010), as well as because wood craftsmanship has relationships with materials that can be inspiring both for sustainability and for wood research (Cabroler et al., 2016; Grabner, 2017; Klein et al., 2016) and vehicles ideals of meaningful work (Marchand, 2021; Morris, 1884).

## ILLUSTRATIONS THROUGH TWO RECENT TRANSDISCIPLINARY RESEARCH PROJECTS

### **Time4WoodCraft – The time of wood craftspeople, the time of crafts 'woods**

This example focuses on one of the transverse questions above, that on the different dimensions of Time, which extends across different fields of crafts.

We conducted in 2021-2022 an exploratory, transdisciplinary project called Time4WoodCraft. This acronym reflected that "it is time" to rethink our relationship to time and to the living, as well as the wish to integrate 4 approaches from the fields of biological/environmental, physical, human and social sciences, and of crafts practitioners. We were 12 collaborators, six academic researchers – into (bio-) mechanics, ethno-archaeology, dendrochronology – and six craftspeople – into cabinet making / restoration, musical instruments making, timber-framing (Brémaud et al., 2023).

We have explored, in a rather auto-ethnographic way, the different modalities of time expressed by these (our) different specialities. Through case studies bridging craft discourses and laboratory experiments, we have studied the perception (by craftsmen from different trades and cultures) of temporal markers – in terms of the formation of wood or of its physical-mechanical behaviour. We have compared various dimensions of the notion of wood ageing, that can have different meanings depending on cultural backgrounds, on intended uses, or on underlying wood physics, including reversible or irreversible phenomena. And we interviewed craftspeople about the different temporalities that are constitutive of craft work. This exploratory work confirmed the central place of time, with "wood as a recorder of time" – probably more than any other material, and with temporalities – of work, of the forest and of wood, historical – as essence of craftsmanship (Brémaud et al., 2023).

### **Guitar-makers' woods – Biodiversity, functionality and aesthetics in (a) craft culture(s)**

This other example is focusing on a given field of craft, while extending across the four questions proposed.

Guitar-making is a good case study, as it is a particularly lively and diverse craft, in terms of both cultures and functions. This craft also benefits from a growing body of ethnographic or anthropologic research. Beyond the image of "the" guitar as instrument of globalised culture (Gibson, 2019), guitar-making as a craft ramifies into many material cultures and communities of guitar-makers, some traditional and emblematic of places, some in the movement of "neo-artisans" (Dudley, 2014). In this research, I combine surveys (craftspeople and/or wood suppliers); lab-characterizations of physical, vibro-mechanical and colorimetric properties; meta-analyses of scientific and professional sources. On the question of Time, I'm looking at the changing uses of wood in face of the increasing scarcity of traditional species. This results in a huge diversification, with >400 species cited. The analysis (from maker's words and/or from wood characteristics) of the multi-criteria qualification of wood by guitar-makers confirms that their relation with wood is both highly technical - physical and acoustic - and highly sensory and aesthetic. I analysed the links with the conservation status of the species, for traditional or alternative uses, and for different functions (Brémaud, 2025b). Setting this in relation with our physical characterisations suggests that the woods with exceptional acoustic and optical properties are also the

most threatened species (Brémaud, 2025a). According to the craft guitar-makers, the relationship with wood is very important in their choice of profession, and they reported both clear ecological and ethical considerations, and difficulties in adapting, to the biodiversity crisis.

## CONCLUSION

In this abstract, I wanted to argue in favour of decompartmentalising research in wood science and craft science, that would be mutually beneficial. I propose some possible transdisciplinary methodology – that we have tested in our past research between wood scientists and wood crafts experts, and identify some transversal questions that appear to me fundamental both in wood and in craft. A point of the argument I would like to promote is that, by adopting one only of the relevant viewpoints or disciplines/practices, one would obtain a fragmented vision only, or even, in some cases, some difficulties or bias in the interpretations. The most important point seems to be that considering together the characteristics of wood and of craft knowledge and practice is apt to highlight diversity and complexity.

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