Editorial: Crafting Knowledge

Maija Mäki, Anna Rauhala, Jaana Saarikoski & Kirsi Sonck-Rautio

Humans are not the only animals that use tools. Nevertheless, using tools is considered one of the fundamental characteristics of the human species. Understanding the properties and potential of materials in our surroundings, their innovative use and modification, have played a significant role in humans adapting to their surroundings and in the development of human cultures. We learn and know how to use tools and materials; we develop new methods and techniques to manufacture the most complex craft work, and yet we are not always able to explain how we acquired such knowledge. Our intelligent hands just work their magic (Panelius et al., 2012).

Handicrafts and artefacts are an essential part of our material culture. Ethnological research on materials and material culture integrates both the tangible and intangible aspects of craftsmanship. Contemporary research examines skills and creativity, functionality as well as the individual and cultural meanings and values assigned to craft making. Craft making, both as an experience and a process, encompasses maker-related aspects and external factors, some of which are timeless. The maker's cognitive and sensorimotor skills, as well as their affective states, are influenced by materials, design traditions, economic realities and the intrinsic need to create. (Fryckman, 1990; Ehn, 2011; Rauhala, 2019.)

Crafting is an affective process in multiple ways. A craft process as creative practice entails many uncertainties. No matter how well the process is planned, materiality can impact it in unexpected ways, and the end result can be unpredictable. However, when the crafter relies on their tacit knowledge and lets materiality guide the process, new ways of making can emerge. Sometimes allowing oneself to make mistakes is crucial for devising new ways of thinking and doing. Like mistakes, narrowed possibilities can also stimulate creativity: during difficult times, like a pandemic, a war or food and material shortages, people are forced to seek survival strategies. Often in this pursuit, they start using materials in innovative ways. Besides being

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 1–5. https://doi.org/10.23991/ef.v51i1.147569

a potentially lifesaving practical skill, crafting can also help people cope with emotionally difficult times. It can take the crafter's thoughts to a happy place and serve as a method for managing one's own feelings and emotions. (Collier, 2011; Rauhala, 2024.)

Craft skills may ensure survival or success in life for anyone – a good enough reason to document and research crafting skills – but another benefit of crafting that researchers should not forget is that craftmaking leads to a more comprehensive understanding about materials. For scholars, this means that craftmaking can lead to a fuller understanding of our research topics. Crafting is inherently aligned with recycling, self-sufficiency, and the do-it-yourself ethos. These elements serve as effective and essential factors, as well as creative statements, in a time of accelerating climate change and the Anthropocene. Through trial and error, humanity has come a long way in utilising various materials to produce objects and also in developing craftsmanship and technology as a part of everyday life. This progress is continuing, and in the future we will have every possibility to keep moving towards more and more responsible and wiser uses of natural resources. Essentially, this is about prioritising cultural values.

In this special theme issue (1/2024) of *Ethnologia Fennica*, we present a broad range of articles that deal with crafting, crafting knowledge and creative material practices. What kinds of creative methods have been experimented with, invented and found useful in the material practices of communities and individuals? Furthermore, how have these innovations and different kinds of craft skills in various contexts influenced our societies and everyday life? Finally, how has crafting affected our emotions and values? The issue includes two research articles that explore the crafting theme from the perspectives of skills and materiality. In many cases, the authors are skilful artisans themselves, and they delve into the different crafting skills through their own experiences and visions. Anete Karlsone explores the traditional Latvian crafting skill of dyeing fabrics with natural dyes. Karlsone has made use of her dyeing skills when researching various ethnographic sources from the 18th through the 20th centuries. Natural dying experiments and processes helps her study, for instance, the value of colours, as in this case. In the article, Karlsone claims that dyeing experiments are essential tools for interpreting historical data, like written sources, on historical dyeing techniques. In another research article, Ewa Klekot presents an (auto)ethnographical reflection on pottery craft as a way of life in a modern village in Masuria, in the northern part of Poland. Klekot uses craft-related bodily knowledge and the embodied recognition of materials to critically reflect on the traditional notion of folk art and craft in Poland. She presents pottery craft and life in

the pottery workshop as an environment of knowledge building and experimentation. By co-crafting in the *garncarnia* with local pottery makers, Klekot was able to draw an auto-ethnographical conclusion about the material in motion. In the article, she conceptualises the embodied knowledge of clay and pottery making and its connections to the environment and the village itself. In her ethnographic analysis, Klekot makes visible the features of the folk craft lifestyle in a rural village that are otherwise only available and displayed through crafting practices.

In two review articles, the theme of this issue is approached from the perspective of materiality, sustainability and new, experimental techniques and materials. Linn Sigrid Bratland discusses mechatronic technologies and traditional craft. Her experiences with the crafting process of renovation work have led to some unexpected outcomes, which prompted her to engage in deeper and more theoretical reflections on body-machine relations. Bratland argues that craft not only exemplifies and conveys the meanings of such relationships, it is also a process of intra-acting with and co-creating both physical and conceptual phenomena. In another review article in this theme issue, Stefanie Mallon examines the materiality of mushroom-'leather'. This is an experimental fabric, made from fungi. Mallon has conducted her own fungus-growing experiments and analyses in the article the properties of the mushrooms and current narratives about sustainability in the fashion industry from the perspective of the information economy. The complex nature of mushroom-'leather' shows the challenges of crafting new materials. Mallon shows that mushroom-'leather' has many symbolic dimensions, with companies and consumers placing their hopes in its potential as a substitute material for animal skin in clothing and the fashion industry in the future.

The issue also includes several book reviews and one conference report. Aino Laiho and Sauli Okker describe and evaluate the XII Ethnology Days conference, which was hold in March 2024, in Helsinki, with the theme being 'voices and practices in research'. The issue additionally includes one review of a recent doctoral thesis, a study of vernacular garden culture in the province of Kainuu, in northeastern Finland, by Marjukka Piirainen. The review has been written by Kati Mikkola. Lina Metsämäki has reviewed a new book by Jonas Frykman and Orvar Löfgren, who explore the Swedish *folkhem* concept, the 'people's home' family and community model applied in Swedish everyday life from the 1930s to the 1960s.

Three rather extensive article collections are reviewed in this issue of *Ethnologia Fennica* as well. Elisa Kurtti evaluates the new and important methodological guidebook *Kulttuurien tutkimuksen menetelmät*, edited by

Outi Fingerroos, Konsta Kajander and Tiina-Riitta Lappi. Ulla Kallberg examines an article collection about the history of Nordic ethnology at Åbo Akademi University, in Finland. The book commemorates hundred-year history of the university chair in Nordic ethnology, which still makes important contributions to Finnish ethnology, with widespread social significance in Finnish society. Finally, Arja Turunen reviews the handbook on university pedagogy in ethnology and anthropology entitled *Kulttuurientutkimuksen pedagogiikka*, edited by Sanna Lillbroända-Annala, Maija Mäki and Pia Olsson. This is the first Finnish publication concerning university pedagogy in cultural research. As Turunen mentions in the review, there are still many more topics to discuss on university pedagogy in the fields of cultural research. It is important to continue to reflect on and evaluate pedagogical solutions and the connections between research and teaching. In *Ethnologia Fennica*, we rarely receive manuscripts concerning university pedagogy in ethnology or related fields. We hope that this tendency might change in the future, and we are welcoming pedagogical manuscripts as well as other types of manuscripts from our multidimensional and fascinating field.

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Cover photo: The mushroom-'leather' hats made by the professionals of Centre of Traditional Technologies (CETRAT). The Centre of Traditional Technologies Příbor focuses its research activities mainly on the rural area of the Western Carpathians. Experiments play an important role in the Centre of Traditional Technologies. CETRAT focuses on experiments that can serve primarily for the needs of ethnological interpretations.
Picture from SIEF 2023 conference, by Maija Mäki.

Anete Karlsone

Dyeing with Natural Colorants
A Research Method and an Ever-Changing Traditional Skill[1]

Abstract

This paper explores the use of dyeing with natural dyes in research, as well as a tool for retaining normality of life in crisis situations. Nowadays craftsmanship skills, and especially traditional crafts can double as a research object and a research tool. Dyeing fabrics with natural dyes is a traditional crafts skill which entails a high potential for creativity, and which is still practised in Latvia today. In the past, this skill often became a creative way for retaining the quality of daily life during wars and other crisis situations. Nowadays natural dyeing is not only a means of creative self-expression through traditional crafts, but the process also helps to study the value of colours, through understanding the complexity or simplicity of obtaining a particular colour, as well as the resulting colour palette, etc. The author of this paper has used her dyeing skills in researching various ethnographic sources from the 18th – 20th centuries. Dyeing experiments help to adequately assess descriptions of fabric colours in written sources from various historical periods, and to interpret historical guides about ancient dyeing techniques and methods.

Keywords: Natural dyeing, crafting knowledge, traditional craftsmanship, experimental ethnography, Latvia

1 This study was supported by the project *The territory of Latvia as a contact zone between different cultural spaces, religions, and political, social, and economic interests from prehistory to the present day*, funded by the University of Latvia, No. ZD2015/AZ85.

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 6–31. https://doi.org/10.23991/ef.v51i1.140867

Introduction

The main subject of this paper is traditional craftsmanship as a set of skills that allow for the acquisition of new knowledge. It became a part of survival strategy during crisis situations, thus being preserved and handed down to the next generations, allowing it to be used in modern research. In modern era craftsmanship skills, and traditional crafts in particular, can double both as a research object and a research tool (Hopkins 2013; Botwid 2022). Dyeing fabrics and yarns with natural dyes, is a traditional craft skill which entails a high potential for creativity, and which is still practised in Latvia today. Nowadays the skill natural dyeing can provide new information when used in experimental research (Anderson Strand et al. 2009; Hartl et al. 2015). So far experimental research has mostly been used in archaeology, especially for interpreting the craft technologies used in archaeological finds (e.g., Damlien et al. 2018), but this method can also be useful in history or ethnology for studying historical information from written sources. In traditional crafts, including natural dyeing, it is equally important to have knowledge and practical skills. In addition, tacit knowledge (Polanyi 1966), which the apprentice can only obtain by working with a master craftsperson, is also essential when applying the acquired knowledge in practice (Gascoigne & Thornton 2014; Kikuchi 2015). In the field of natural dyes, the knowledge gained through observation and practical experience was very important for a long time. The dyers did not always fully understand the theory of the process and its rationale, but they knew what and how to do it to get the result. The descriptions of dyeing recorded in ethnographers' field studies, which list the actions to be performed (sometimes only the plant and the result to be obtained), but do not explain why these actions were necessary, allow us to judge this. In dyeing with plant dyes, which was practiced in a rural environment or inherited as a traditional skill, much of the knowledge was non-verbal, or, accordingly Michael Polanyi: "we can know more than we can tell" (Polanyi 1966: 4). Even today, inherited dyeing techniques are still practiced, but the principle of operation and the chemistry of the substances involved have not been fully investigated. For example, dyeing with a long fermentation process. However, the lack of this knowledge does not preclude the use of ancient dyeing methods and less frequently used plants with which these methods are used. One of the ways to preserve traditional knowledge is to accurately document and study it, clarifying all the components involved in the process and their operating principles. However, this is laborious work and not always possible. Therefore, there is another way: to learn this knowledge (even if you do not fully understand it), practice and pass it on. Essential to the acquisition of natural dyeing skills, as well as other traditional skills, is Polonyi's recognition that

> It brings home to us that it is not by looking at things, but by dwelling in them, that we understand their joint meaning (Polonyi 1966: 18).

For this reason, the longer these skills are continuously practised in a population, the better for their preservation in use and transmission to future generations. This paper will discuss two aspects related to the importance of craftsmanship skills: 1) Retaining the skillset of natural dyeing and using it during crisis situations. This aspect formed the basis for the use of these skills today, including in research; 2) The use of craftsmanship skills in research and for obtaining new information. Using examples of individual case studies, this paper will demonstrate how practical dyeing skills can be used in research work. The author has used her knowledge and skills in dyeing to study various ethnographic sources from the 18th to 20th centuries.

Research sources and methods

This research article is based on studying historical written sources, the results of practical experiments, as well as personal experience of practising natural dyeing for more than 15 years. To study the natural dyeing traditions in Latvia, mainly different types of written sources were used: such as press publications, records of ethnographic expeditions, and folklore materials. Written sources provide information about the existence and development of natural dyeing traditions in the territory of Latvia mainly after the invention of aniline dyes in the second half of the 19th century.[2] Different sets of sources reflect the dyeing traditions of different time periods.

Two repositories were mainly used for studying the unpublished sources – notes from ethnographic fieldworks – for this paper: 1) Ethnography Department of the National History Museum of Latvia, which houses notes from ethnographic expeditions to various parts of Latvia organised by the Latvian Council of Monuments between 1924 – 1943. These ethnographic materials, although in different numbers, are from all the cultural-historical regions of Latvia: Vidzeme, Latgale, Kurzeme, Sēlija and Zemgale. Information about natural dyeing can be found in descriptions from collection No 47, "*Krāsošana, mazgāšana, balināšana*" [Dyeing, Washing, Bleaching], as well as partly in documents from the collection No 35, "*Sieviešu apģērbs*" [Female Dress].

2) The second collection (curated in the Repository of Ethnographic Material, Institute of Latvian History of the University of Latvia), which mainly consists of materials gathered from ethnographic fieldworks during the Soviet occupation period in Latvia (the earliest dating from 1947), holds information about natural dyeing in documents about making and using textiles. Natural dyeing was not included in the list of main research themes for the fieldworks, and thus materials about it were only gathered if a member of the fieldwork was personally interested in the subject. Nevertheless, information

2 The first aniline dye was patented by H. V. Perkins in 1856 (Johnston 2009).

about natural dyeing was occasionally gathered during the whole Soviet occupation period from the late 1940s until the late 1980s.

The published sources – Latvian press – provide diverse information about natural dyeing in Latvia. The earliest publication is from 1768, in the periodical *Latviešu Ārste* [The Latvian Doctor], but more regular publications on the subject appear in the end of the 19th century. During the 20th century and especially the Interwar period the Latvian press published information about various public activities related to natural dyeing, as well as ethnographic materials such as lists of dye plants and dyeing guides. These publications demonstrate the public interest in this tradition and show the dynamics of its development (see more: Karlsone 2016).

Another significant source of information is Martha Bielenstein's (1861–1938) study *Die altlettische Färbermethoden* (Bielenstein 1935), as it is a compilation of both, previously published materials about the use of natural dyes in Latvia, and original, previously unpublished information on this subject, gathered by Bielenstein herself. This book also contains valuable ethnographic information about other related subjects such as leather tanning, the use of bast and nettle fibres for producing textiles, etc. Apart from written sources, this paper is also based on personal experience of regularly practising natural dyeing for over 15 years. Applying the practical knowledge for a specific purpose – to test or specify information from historical sources – results in gaining new, more detailed knowledge about the process of dyeing in particular and the traditional crafts in general, as well as more broadly about the producing and use of fabrics, including themes concerning the history of clothing.

Natural dyeing skills in crisis situations

In order to use crafts skills, including natural dyeing, to obtain new knowledge, a degree of existing, inherited knowledge in the subject is required. Inherited knowledge can be considered the set of skills that are learned from the previous generation of craftsperson or relatives through direct action, observing and participating in the process. Sometimes particular circumstances, such as economic crises, can help to preserve such knowledge. During war or other crises when the normal functioning of the economic system was disrupted, these inherited skills regained value and popularity. To illustrate this point, a brief overview of how traditions of natural dyeing developed in Latvia after synthetic aniline dyes is provided below.

Until the middle of the 19th century, natural dyeing was the only way to obtain coloured clothes and other textiles. After invention of synthetic aniline dyes, natural dyeing quickly became an alternative technique, losing its key role in the production of coloured fabrics. The Latvian intelligentsia became interested in traditional craft skills, including natural dyeing, as a part of national cultural heritage,

in the end of the 19th – beginning of the 20th century (Skrusits 1900; Skruzītis 1895; 1902). During that time natural dyeing was seen as a vanishing ancient skill with a need for preservation, and people began to appreciate its value. However, the use of this skill was dictated more by economic, rather than ideological, circumstances. According to the materials of the ethnographic fieldworks organised by the Latvian Council of Monuments, in rural areas, especially in the poorer region of eastern Latvia, natural dyeing was still practised even after the discovery of aniline dyes. In other regions of Latvia, both in the cities and countryside, the new dyeing techniques and the use of synthetic colours made a rapid advance after 1860. The main evidence for this can be seen in dealers' adverts in the Latvian press (such as *Mājas Viesis* [The Houseguest] 1864: 7, 11, 19, 23, 32; 1868: 3).

Ancient craftsmanship skills did not go out of use entirely. According to the materials from ethnographic fieldworks of the 1920s and 30s, housed in the repository of the National History Museum of Latvia, the first World War and its negative impact on daily life encouraged people to return to traditional craftsmanship skills, including natural dyeing. The fieldwork notes also mention when the dyeing took place:

> In the olden days, and also during the war, when dyes could not be bought, people dyed their fabrics and yarns with natural dyes, including tree bark, flowers, onion peels, and other plant materials (LNVM ZAE 47: 87, Cēsis district, written down in 1926, similar information can also be found in the following documents: LNVM ZAE 47: 120, Madona district, written down in 1928; LNVM ZAE 47:502, Tukums district, written down in 1930; LNVM ZAE 47: 12, Rēzekne district, written down in 1926).

References to the First and Second World Wars also exist in the materials from ethnographic fieldworks in Latvia gathered during the Soviet occupation after the Second World War, which are curated in the Repository of Ethnographic Material, Institute of Latvian History of the University of Latvia. In these materials the First World War is simply referred to as the World War:

> During the World War people dyed with natural dyes (E 12, 650, also E 12, 648; E 12, 2727, Limbaži district, written down in 1957).
> After the World War you could not get such [synthetic] dyes. So people used alder and other plants [for dyeing]. (E 13, 3280, Valka, written down in 1958.)

During fieldworks which took place in Latvia in the first decade after the Second World War (1947–1955), the narrators avoided mentioning the most recent war, as well as the poor economic situation during and after the war. This is because such information may have been perceived as criticism of the Soviet regime and could subsequently end in repressions. Only after 1960 the

narrators began to mention dyeing fabrics during the Second World War (during that time, the period from the 22nd of June 1941 until the 9th May 1945 was called the Great Patriotic War as per the official Soviet Union's rhetoric).

> The narrator's mother almost always dyed with plants when the narrator was young. The narrator also used plants for dyeing during the Patriotic War. (E 27, 4788, Balvi district., narrator was born in 1895, written down in 1963.)

> During the narrator's youth natural dyeing was very popular. In more recent times and nowadays the practice is rarely used. It was again used between 1940–45 when shops ran out of packaged [synthetic] dyes. (E 21, 1437, Krustpils district., narrator was born in 1879, written down in 1961. Similar information can also be found in the following documents: E 28, 379, E 28, 380; E 28, 381; E 28, 386 and E 31, 3423.)

Increased public interest into natural dyeing during this period can also be sensed when analysing publications in the Latvian press. (see Fig. 1) Between 1939 and 1944 (before the second Soviet occupation) there was a substantial rise in publications related to natural dyes. Most of these were practical guides for gathering the plants and using them for dyeing fabrics and yarns. As the war increasingly disrupted everyday life in the territory of Latvia, the publications gave direct hints that natural dyeing was advisable due to economic considerations:

> Natural dyeing was already known to ancient Latvians when they could not obtain the expensive dyes. Nowadays we also must turn to natural dyes which we obtain from flowers, berries, roots or tree bark. (Vīdnere 1944.)

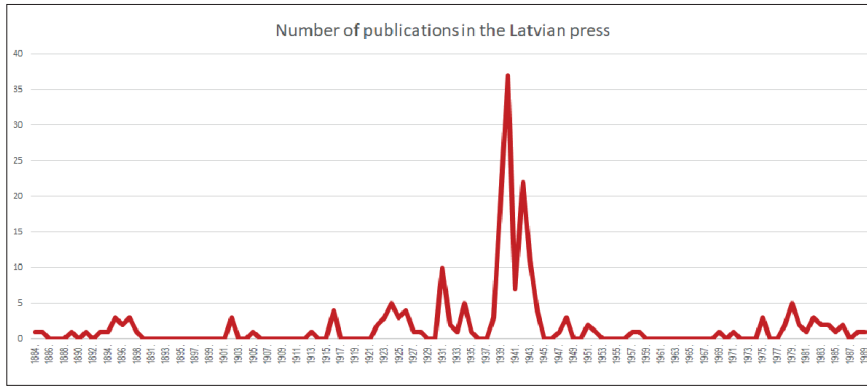

Figure 1. Number of publications in the Latvian press 1884–1989.

Sometimes the advice included substituting mordants (metalic sulphates) with locally available plants (Fricberga 1942). Mordants are substances that are necessary in the dyeing process so that the dye molecules can bind to the fibre. They were usually compounds of different metals: potassium aluminum salt or alum ($KAl(SO_4)_2 \cdot 12\ H_2O$), iron vitriol or iron sulfate ($FeSO_4 \cdot 7H_2O$), copper vitriol or copper sulfate ($CuSO_4 \cdot 5H_2O$). Nowadays, the use of copper is avoided because it is poisonous. However, in the historical tradition it was often used in Latvia (Karlsone 2016: 16).

The ability to use natural dyes for dyeing fabrics and yarns was among the crafts skills used to maintain the quality of life during economic hardships in the First and Second World Wars. Using traditional crafts skills as a part of survival strategy allowed them to be actively practised and thus handed down to the next generation who could learn through direct observation of how dyeing was done. This in turn increased the period of time during which the skills were actively practised.

Although today the economic situation in Latvia is stable and the skill of natural dyeing serves as a hobby to maintain the quality of life, this skill is still useful for helping others. For example, after the full-scale invasion of Russia into Ukraine in 2022, the skill of natural dyeing in Latvia is used for re-dyeing fabrics into natural colours, which are then used for making camouflage netting for the Ukrainian army (see Fig. 2). The shades acquired

Figure 2. The fabrics overdyed with oak bark and onion skins for camouflage nets dry in the spring sun. Photo: A. Karlsone.

from plant dyeing are more in harmony with nature's surroundings, and it is more economical/cheaper than buying dyes for dyeing a large amount of fabric. The spring 2023 was especially busy for this activity.

The opportunity to apply ancient skills today gives people more motivation to learn and preserve them. It is the practical necessity, not only the artistic quality of the result, that is a very important aspect for the maintenance and relevance of craft skills. Nowadays, however, knowledge of ancient skills and the ability to apply them practically can be used as a research tool.

The use of traditional craftsmanship skills in research

The use of natural dyeing in research can be regarded as a method of experimental ethnography, which in many ways resembles the method of experimental archaeology (Coles 1979, Andersson Strand et al. 2009). Both experimental methods are based on carrying out actions in modern times which are mentioned in historical sources but are no longer practised in modern times, to gain new knowledge about a process or a phenomenon. The method is especially important when an ancient traditional craftsmanship technique or skill is partly or fully forgotten (Hartl et al. 2015). Likewise, repeated experiments test the reliability of various ancient techniques, thus revealing the credibility of the source and adjusting the information about the achievable result.

Like experimental archaeology, this method has several drawbacks. Due to objective reasons, it is impossible to carry out the experiment in exactly the same circumstances as described in the historical source. The level of skill and experience of the master craftsperson who carries out the experiment is also of considerable importance. As it is with any crafts skills, in natural dyeing it is not sufficient to just know the theory of the process. The person must know how to do it, which means having practical skills or the ability to apply this knowledge, as well as the so-called tacit knowing which is difficult to express (Polanyi 1966).

The result of the experiment depends directly on the level of the craftsperson's practical skills. To lessen this subjective factor, ideally the experiment should be carried out by several craftspeople and repeated several times. However, nowadays when research into the use of natural dyes (and practical dyeing as a part of this process) often depends on the enthusiasm of particular craftspeople, verification of the results is up to a single craftsperson carrying out the experiment several times.

In the practical research process, it is not always possible to meet all preconditions. For example, when working on restoring a forgotten or partly

described technique, which might be called the study phase, it is not possible to repeat the experiment precisely the same way, as it is still being studied. The process is further complicated by the nature of ancient techniques which were influenced by various natural circumstances. Nevertheless, even the first stage of research, which is aimed at finding the lost pieces of information by means of practical dyeing experiments, is interesting and creative. Below is a description of several experiments which were carried out to find answers to various questions:

1) An attempt to reconstruct a forgotten technique of obtaining red colour by using *Origanum vulgare* L. in the dyeing process. So far, the full reconstruction of this ancient technique remains unsolved, and further experiments are necessary;
2) Verifying and adjusting a dyeing method described in historical sources by fermenting *Rubia tinctorum* L. in beer. As a result, a predictable, replicable method for obtaining the red colour, was achieved;
3) Verifying the process of dyeing to find out how to dye yarn in a clay pot and what result can be obtained, without the use of metal vessels. The result of the experiment confirmed that it was possible to heat a clay pot on a special furnace and to obtain a high-quality colour in the process, but that it required substantial time and resources.

Reconstruction of the dyeing recipe for obtaining red colour by using *Origanum vulgare* L.

In the study of traditional cultural heritage, including the application of natural dyes, the study of locally available resources is particularly important. In traditional culture the red colour is very important both in an artistic and symbolic way (Pīgozne 2020, 140–151; Kursīte 1996, 58–65). So far, *Rubia tinctorum* L., brazilwood, and cochineal remain the most widely globally studied sources of red colour. However, Latvian peasants also used alternative sources of red colour in their traditional dyeing techniques. Although these plant sources were mostly found in the local environment, not all have been thoroughly studied. One such plant was oregano, *Origanum vulgare* L., which has been mentioned in Latvian folklore and ethnographic sources as a red dye.

Scientific literature holds a vast amount of information about *O. vulgare* as a pharmaceutical plant which contains valuable essential and antioxidant oils (Oniga et al. 2018; Soltani et al. 2021; Teixeira et al. 2013; etc.). There is hardly any information about this plant's properties as a dye

and dyeing techniques using it. In 2016 the first studies were carried out about *O. vulgare* as a dye used in Latvian traditional culture, and the results were presented in an international conference "Dyes in History and Archaeology" in 2018 (Karlsone & Nakurte 2018). The experiment was based on linguistic, ethnographic and folklore sources as well as on the experience of the dyer.

In Latvian language *O. vulgare* is *parastā raudene*, where the word *raudene* is a derivative of *ruds*, which translates as reddish/ginger/rusty. Other colloquial names for this plant are:

- *sarkanes* (from Latvian *sarkans* – red)
- *dzīpari* (old Latvian name for fine, coloured yarn, usually used for embroidery)
- *sarkanā rauda* (the red *rauda* [reddish orange/ginger/ rusty])

Latvian folklore also holds information about the use of oregano as a dye. A large portion of folklore is folk songs or *tautasdziesmas* – short verses with mostly four, or sometimes more lines which follow a traditional style (rhythm, characters, language), created by the nation, and passed down to the next generations in spoken form. Folk songs tell about the Latvian peasants' ancient cycles of life and work, as well as their concepts of mythology. *Tautasdziesmas* cannot be dated with precision, but researchers believe that most were created during the 13th–16th centuries (Šmits 1912; Ozols 1961, 11–12). In some cases, the verses describe earlier phenomena, for example, archaeological material dating from the 12th century CE (Urtāns 1987). Likewise, much more recent realities of life from the 18th – 19th century have also been described in *tautasdziesmas* (Pīgozne 2011, 211, 216).

Folk songs also mention plants used in dyeing, and these include woad (*Isatis tinctoria* L.) for obtaining dark blue colour (LD 7137, 7181, etc.), bedstraw (*Galium* L.) for obtaining red colour (LD 7122, 7123, 7127, etc.), as well as alder (*Alnus* L.) for obtaining dark or black colour (LTDz 9174; LD 20555). Mentions without naming a particular colour include birch (*Betula* L.) (LTDz 10 711), as well as club moss (*Licopodium* L.) (LD 7139, LTDz 9205, etc.) with indirect reference to the yellow colour. Oregano (*O. vulgare*) has been mentioned as equivalent to bedstraw (*Galium* L.) (LD 7138, etc). As mentioned above, one of the common names of oregano in Latvian is *sarkane* (*sarkane* = from the Latvian word *sarkans* = red). Accordingly, this plant had been known and used as a red dye in the territory of Latvia for centuries. Folk songs only mention a small portion of natural dyes available in the region, possibly because these were particularly important compared to others. Indeed, archaeological material suggests that blue and

red colour adorned the clothing of Balts and Baltic Finns in the territory of Latvia from as early as 9th–13th centuries (Zariņa 1970, 44–45, 60, 90, tab. 26; Zariņa 1988, 31, tab. X–XII, XIV; Žeiere 2008, 34, 39–40, 55–61; Pīgozne 2020, 59–73, 78–89, 269–293).

Ethnographic sources also mention dyeing with oregano (*O. vulgare*). In total, 26 known descriptions have been written down from 1876 until 1942 that mention dyeing with *O. vulgare*. 10 of these are unpublished sources – fieldwork notes (LNVM ZAE 47, 35) but 16 are publications of ethnographic material. Seven are new publications (the rest repeat previously published information). Dyeing with oregano in the "usual" way when fresh or dried plants are soaked and heated, after which the yarn is immersed and heated in the dye bath, only results in different greenish-brown colour tones. To obtain red tones, a different technique is needed.

Only eight entries in ethnographic materials contain sufficiently detailed recipes or guidelines for dyeing with *Origanum*. Four of these mention fermenting. Obtaining the red colour by using *Origanum* together with apple tree (*Malus* spp.) leaves is also mentioned in four entries. Colours mentioned in the descriptions are red, dark red, bluish ('cold') red and brown. However, the description of the dyeing process itself is in most cases vague.

The most detailed description of the dyeing process, which mentions fermentation, as well as adding apple tree leaves to oregano, dates from 1876:

> The red yarn was dyed in "*sarkanes*" (a plant species) [oregano] and apple tree leaves. Apple tree leaves, especially those with red leafstalks, and *sarkanes* before flowering were gathered, chopped finely together and placed in lukewarm water, drained, and spread on a fabric to dry in the sunshine until reddish in colour, then placed in a pot, covered with warm water, adding yeast, and fermented for a day or more, then well-washed white wool yarn was added, and fermenting was continued for approximately three days; then everything was transferred to a pan and boiled for a long time, then the yarn was removed and the remains of the plants were shaken off, and the yarn was dried in the sun. (Blaus 1876, as cited in Ozoliņš 2017, 48–49.)

The information from the recipes was tested with practical experiments or the method of experimental ethnography.

Flowering ends of stems of *Origanum vulgare* L. and apple tree *Malus* spp. leaves were used in the experiment in a ratio of 3:2. The plants were chopped, dipped in the water, placed in the sunshine for one day on a black plastic sheet, and transferred inside for the night, with the approximate room temperature of 25°C. As a result of exposure to air, warmth, and moisture the

Figure 3. Fresh, chopped flowers of *Origanum vulgare* L. and leaves of *Malus domestica* Borkh moistened and placed in the sun, after exposure for two days. Photo: A. Karlsone.

plant mix obtained a reddish-brown hue (see Fig. 3). In Latvian this process is called "*sarcināšana*" [rosing]. This process took two days.

Fermentation was continued by pouring warm (40° C) water over the plants in a vessel and keeping the vessel in a warm place in the temperature about 35–40 °C. Afterwards two yarn samples (in ratio 2:1, plants to yarn) were added in the mixture, one of which was pre-mordanted with alum and tartar ($KC_4H_5O_6$ or potassium bitartrate; alum + tartar, weight proportion 8+7g/100g fibre), while the other was not mordanted. After six days the fermentation process was complete, but none of the yarn samples had obtained the expected colour. (see Fig. 4)

Considering previous experience of the dyer, the dyeing process was continued with heating. The temperature during this stage did not exceed 60°C. To intensify the process, previously drained plant particles were added. The resulting colours of the yarns were like those obtained during previous experiments – creamy brownish red. The mordanted yarn was visibly brighter than the untreated one (see Fig. 5), although in previous experiments a similarly bright colour was obtained without pre-mordanting.

The reconstruction of this technique requires further experiments. So far, the experiments have resulted in reddish-brown colour, rather than the bright,

Figure 4. The result of the first fermentation-dyeing stage. Photo: A. Karlsone.

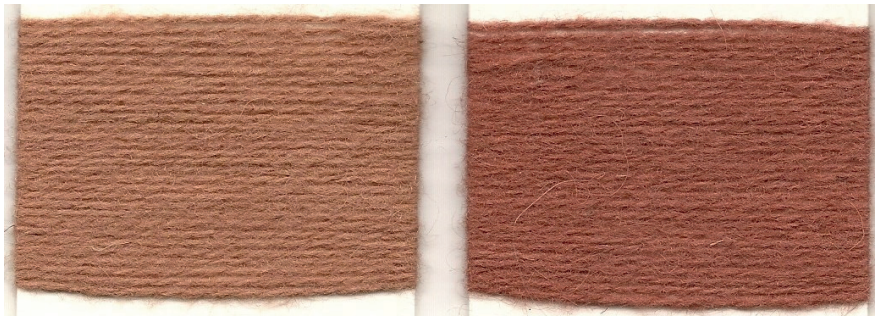

Figure 5. The result of the dyeing experiment by fermentation of *Origanum vulgare* L. and *Malus domestica* Borkh. On the left - yarn without mordant, on the right - mordanted yarn with alum. Photo: A. Karlsone.

or wine red, colour mentioned in the ethnographic sources. Accordingly, it is necessary to test additional components which might have been omitted from the sources, relying on personal dyeing experience with other plants, as well as intuition, as it turns out that historical written sources provide incomplete information about the dyeing process with *O. vulgare*.

Dyeing with bedstraw by fermenting in beer

The known Latvian written historical sources mostly provide incomplete and general information about natural dyeing (no dyers' books have survived here, unlike elsewhere in Europe, for example, [Anonim] 1768; Warg 1789; Mairet 1916). Even when the dyeing process has been described seemingly thoroughly, the question always remains: was it really the way? Has it been described in sufficient detail? To answer these questions, and to clarify what tones can be obtained with the described method, practical experiments are carried out. Not all historical entries can be used as guides for dyeing experiments. Often the information they provide is too general or incomplete, and as a result several sources have to be combined. The experimental method can also be used when a source is seemingly sufficiently informative, but more detailed information is necessary about the obtainable result, for example, the colour or its hue.

In 2019 an experiment tested the following dyeing description from 1935:

> Estonia. Red: dried, chopped bedstraw roots are placed in a clay pot, covered with sour small beer, and the pot is covered with leather and placed in a warm place where it must not boil, as this spoils the colour. After three days, mordanted yarn is added and turned once a day to prevent patches from forming. After three days the yarn is ready and beautifully red. – Here pre-made acid is used in the ancient fermentation process. (Bielenstein 1935, 147.)

The first time modern dyeing experiments using Estonian ethnographic material published by Martha Bielenstein with the roots of bedstraw *Galium* and small beer[3] to obtain red colour, were presented in Latvia during the scientific readings titled "August Bielenstein – 190"[4] organised by the Dobele Local History Museum on October 20th, 2016. Using her relative's published notes, the great granddaughter of A. Bielenstein (the granddaughter of M. Bielenstein's brother), textile artist Chistine Tilgner, née Bielenstein, presented the findings of her dyeing experiments. She demonstrated unspun woolen fiber samples which were bright, rich red in colour. Instead of small beer, which Tilgner could not find an equivalent for, she used both pale beer and *kvass* (a fermented cereal-based low-alcohol beverage), and the results were good in both cases. During the process she heated the dyeing vessels in the sun on the terrace of her house in Potsdam, Germany. Tilgner also talked about varied dyeing results when experimenting with the time of the dyeing process. Nevertheless, all colour tones obtained during her experiments were outstanding.

3 In Latvia there is no known equivalent to the traditional Estonian brew, however judging from its description it might have been a drink low in alcohol and thus it is called small beer in this study.

4 *Bielenstein August* (1826–1907) Baltic German Lutheran clergyman, linguist, and Latvian ethnographer, the father of Martha Bielenstein.

Figure 6. Yarn samples dyed with *Galium boreale* L. and *Rubia tinctorum* L.
Photo: A. Karlsone.

Tilgner's presentation inspired the author to achieve similar results. The ingredients mentioned in M. Bielenstein's notes are as follows: dried, chopped bedstraw (*Galium*) roots, sour small beer, and mordanted yarn. K. Tilgner had used common madder's *Rubia tinctorum* L. roots, although the original notes mention bedstraw *Galium*. Both plant species are related and contain similar dyes, except alizarin (Cardon 2007, 107–113, 122–127). Nowadays *R. tinctorum* is a cultivar and its roots are easily available to buy. During previous dyeing experiments when the dyeing liquid was heated on fire, the author obtained similarly intensive red colour both with the common madder *R. tinctorum* and the Northern bedstraw *Galium boreale* L. roots (see Fig. 6). Accordingly, to spare the local wild resources, roots of *R. tinctorum* were used in this dyeing experiment. The initial proportion of the dried roots and yarn was 1:1, but repeated experiments proved that it was possible to achieve good results when the weight of dye plants was smaller than the weight of the yarn.

Dyeing by fermenting in beer was repeated more than ten times over several years, in partly differential circumstances. Various brands of pale beer (alcohol content <4,8%), and homemade beer were used as the fermenting liquid. The quality of the mass-produced beer for the experiments was low, as the main selection criterion was "the largest volume for the lowest price". The dried, chopped dye plants were poured in vessels made of clay, metal (enamelled or with other coating), or plastic, and covered with beer.

The original description mentions that the yarn was fermented prior to dyeing (in ethnographic texts this term is used to describe mordanting the yarn before dyeing), without specifying the type of mordant. Other ethnographic sources suggest that this is a way of describing the use of alum to mordant woollen yarn prior to dyeing (nowadays tartar is often used together with alum). To achieve variation in colour tones, this experiment used both mordanted (alum + tartar, weight proportion 8+7g/100g fibre) and untreated woollen yarn.

For the fermenting process various environments were used: a warm shelf of a traditional ceramic woodburning stove in a country house, a warm water bath for the vessel containing the dyeing liquid, or a sunny, south-facing, sheltered spot by the house. The desirable temperature during heating, which had to be maintained constant for the whole dyeing process, was 35–45°C. When the temperature of the environment dropped, the vessel was covered.

The common madder's roots were soaked for approximately 36–42 hours until most of the plant particles had settled in the bottom and there was no more foam on top of the liquid. Afterwards washed and/or mordanted woollen yarn, which had been pre-soaked in warm water, was placed in the dyeing liquid containing the chopped dye plants. The fermentation process was continued, stirring the yarn occasionally. Parts of the yarn which were in closer contact with the plant

Figure 7. The dyeing process with *Rubia tinctorum* L. roots in the beer. Photo: A. Karlsone.

particles, yielded a brighter colour. If the yarn was not stirred, the resulting colour was distinctly patchy. Patchiness could be prevented by stirring and moving the yarn several times. The dyeing liquid had to fully cover the yarn. (see Fig. 7)

Depending on the amount of the dye plant and the temperature, after 48 hours the yarn had obtained a rich, bright colour. An intensely red yarn was obtained already in the first experiment. By varying the amount of the dye plant and the temperature of the liquid, a sufficiently intensive colour was obtained within 24 to 48 hours. Unmordanted yarn resulted in reddish-brown, orange colours, while the mordanted yarn was bright red.

The continuation of the experiment was based on previous practical dyeing experience of the author, or her specific craftsmanship skills. Since both common madder *Rubia tinctorum* and bedstraw *Galium* contain anthraquinone compounds which react to alkaline environment it is possible to obtain additional hues by rinsing (or immersing for 5–15 minutes) the yarn immediately after dyeing in very warm (40–50˚C) alkaline (pH 9–11) liquid. This causes rapid chemical reaction whereby the brown tones become dark-red and purple, while the red tones obtain cooler and slightly brighter hues. (see Fig. 8) After alkali treatment the yarn is only rinsed after thoroughly drying out. Wool and

Figure 8. Different shades of madder red. From left: 1) without mordant, 2) without mordant, rinsed in an alkali after dyeing, 3) mordanted with alum and tartar, 4) mordanted with alum and tartar, rinsed in an alkali after dyeing. Photo: A. Karlsone.

other protein fibers should not be exposed to alkali for long periods at high temperatures, as this can damage the fiber, but the drying process, which takes place at natural ambient temperatures, has practical no effect on the fiber.

The experiments with red colour by fermenting bedstraw/common madder roots in beer have proven that this is a secure and effective dyeing method. It always produces good results if the necessary conditions are provided. Repeating the experiments multiple times allows to discover potential variations for this dyeing method, which always result in good colour. Accordingly, it is safe to say that the archaic dyeing technique published by Martha Bielen-

stein is reliable and can be used to obtain several tones of red. These could be predicted when repeating the dyeing experiments. This dyeing method does not require constant dyer's attention and peasants of the past could therefore easily combine the dyeing with other daily activities on the farm.

Dyeing yellow in a clay pot

To obtain good quality results in the process it is important to use appropriate equipment, for example, the heating vessels. Nowadays dyers use metal vessels with enamel or other durable coatings, which has no impact on the resulting colour. However, such vessels were not always available in the past. If iron or copper salts were used as mordants (for the dark, grey, and green tones), then durable metal vessels would be suitable for the technique, but it is not clear if the same would be true for lighter tones, such as yellow. Metal vessels available for the past peasants may not have been suitable for obtaining the yellow colour. Indeed, while studying the ancient dyeing techniques the author found an interesting description about dyeing in a clay pot in the book by Martha Bielenstein (Bielenstein 1935):

> At the edge of a ditch or by a small slope they dug a vertical shaft approximately 45–50 cm deep, the top opening of which was exactly as wide as the pot intended for it; afterwards a horizontal tunnel was dug to connect the edge of the slope and the shaft. The tunnel was filled with firewood and a cooking pot was placed on top of the shaft. To ensure sufficient airflow for the fire and to allow the smoke to escape, a sloping draw tunnel was dug at the back of the shaft. (see Fig. 9) Such a furnace is outstanding, especially if dug in clay (we used to make such furnaces in my childhood). Even nowadays we find evidence for the incredible, that a clay pot can be placed on the fire and that it lasts for decades. (Bielenstein 1935, 120.)

This description was used as the foundation for a practical experiment. Two master dyer craftswomen with assistants participated in the experiment. Considering the existing circumstances, a clay-rich bank of a pond was chosen as the location. Digging was simultaneously com-

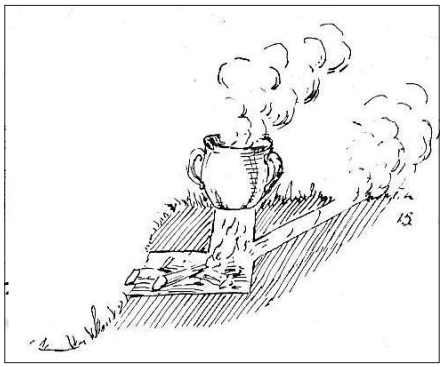

Figure 9. Dyeing in a clay pot. Drawing by Martha Bielenstein (Bielenstein 1935, 145).

Figure 10. Digging was simultaneously commenced for three entrances of the "stove": two from above and one below. Photo: D. Ievina.

Figure 11. On the left: the dyeing process, heating yarn together with leaves of *Malus domestica* Borkh. On the right: the result of dyeing experiment. Photo: A. Karlsone.

menced for three entrances of the "stove": 1) The horizontal heating tunnel, 2) the vertical heat shaft, 3) the sloping draw tunnel. (see Fig.10–11)

The horizontal heating tunnel. Approximately 50 cm down from the plateau of the bank, a horizontal tunnel was dug out. The layer of soil on top of the tunnel was 50–60 cm, and the diameter of the opening was approximately 30 x 33 cm.

The vertical heat shaft. A vertical shaft was dug following the line of the horizontal tunnel into the plateau of the bank, approximately 120 cm from the drop of the bank. The diameter of the opening was about ~17 cm.

The sloping draw tunnel. On the same line as the mouth of the heating tunnel and the vertical shaft, 60 cm from the top of the shaft a sloping tunnel was dug out. Its diameter was ~20cm. It joined the vertical shaft at ~40 cm depth from the top of the soil. Shovels of various sizes and even a long kitchen knife were used for digging.

During the digging process, which took the whole day, the dye plant – domestic apple tree *Malus domestica* Borkh leaves, was soaked in the pond water. This time a replica of a historical unglazed clay pot was used for the dyeing process. Such a pot was available for the participants of the experiment and corresponded with local historical heritage. The pot was made of clay strips, with shape and ornaments added on a potter's wheel (the so-called early wheel-thrown pottery). The mass of clay consists of clay and gravel (burnt, crumbled granite stone particles). This mass has a high heat capacity which reduces the possibility of splitting when the vessel is heated. Moreover, this type of pots had been used in the territory of Latvia over several centuries. The dimensions of the pot: h=24 cm, base diameter 15 cm, the maximum diameter 22 cm, capacity 8 l (the pot was made by Mg.hist., Mg.art. Baiba Dumpe, a potter, and researcher of ancient pottery).

After lighting fire in the horizontal tunnel, it became clear that there was not enough draw in the moist soil and that the smoke was not going where it should. To direct the airflow in the right direction, another fire was lit at the top of the sloping draw tunnel. This helped to achieve sufficient draw and heating of the underground passages. The dyeing experiment was continued on the next day.

The clay pot with apple tree leaves was heated on top of the vertical shaft. The liquid heated up very slowly, possibly because of the cold wind. To minimise the loss of heat, the pot was covered with another, inverted clay pot. When the temperature in the pot reached approximately 40˚C, washed, damp yarn was added. The weight of dry yarn was 150 g. With intensive heating the dyeing liquid reached a temperature of 45˚C. At this point the yarn was temporarily removed, and dissolved alum was added in the pot. Then the dyeing process was continued.

To maintain the temperature constant, intensive tending of the fire was required. Even though the maximum achieved temperature was only 50˚C, the yarn obtained beautiful, yellow colour. The dyeing process took all day. In the evening the heating was stopped, and the yarn was left in the dye bath with leaves overnight. In the morning the yarn was removed from the still warm

dye bath (the cooling process was very slow) and rinsed. The obtained tone was distinctly yellow. (see Fig. 11)

The conclusions reached during this dyeing experiment: it is possible to dye yarn in distinctly yellow colour by dyeing on a ground furnace in a clay pot. The drawback of this method: it requires substantial input of time and fuel. It is possible that the yellow yarn was more valuable if the work required to make it was considered together with its aesthetical quality. The weaknesses of the experiment: 1) The layer of soil above the heating tunnel was too thick. It was deliberately not dug to the recommended thickness because the soil in the location of the experiment was sandy clay and there was a risk of the sand disintegrating when heated. In soils with a higher proportion of clay the top layer of the soil can be thinner, which would reduce the distance between the heat source and the base of the pot; 2) The dyeing vessel can be placed deeper into the shaft thus reducing the loss of heat from the environment; 3) It is possible that using a finer clay pot without the mix of gravel would result in more intense heating of the dyeing liquid, and this should be tested in further experiments.

Conclusion

Traditional craftsmanship skills remain precious in modern times, as a continuous way of creative self-expression and a source of new knowledge. Their use in crisis situations also remains important. Any situation when traditional craftsmanship skills are used in modern times prolongs the active period of their use, thus increasing the possibility of passing the knowledge down. In previous periods of history economic crises caused prolonged necessity for the use of traditional craftsmanship skills. The economic hardship of the First and the Second World War created a demand for ancient skills that had not been entirely forgotten. Craft is both knowledge and skills, which are preserved, perfected, and used to obtain new knowledge through creating new material values. In crafts, the material is closely linked to the non-material, intangible.

Nowadays, practising the craft of dyeing is not only a creative self-expression and a field of traditional crafts, but it allows for a more successful study of the meaning of colours, providing undocumented, accurate knowledge about the complexity or simplicity of obtaining a particular colour, the available colour palette, etc. Only by being familiar with the dyeing process is it possible to adequately evaluate the written sources of different periods about textile colours, including interpreting the records of ancient technologies and dyeing methods. Evidence of dyeing with plant dyes found in ethnographic materials usually provides only fragmentary information about the entire scope of the

process. One of the reasons could be that the narrators could have told only a part of the dyeing process, because they took the rest (unsaid) as self-evident and well-known information, although from a nowadays point of view this is not so. Or something had already been forgotten. Therefore, dyeing experiments to restore ancient techniques are like detective work, tracing and uncovering ancient knowledge step by step. Experience gained from previous dyeing sessions, intuition and familiarity with ethnographic material are usually the determining aspects in restoring ancient knowledge.

In order to restore ancient skills in modern conditions, the essence of the process must be preserved - the use of natural dyes, mordanting, fermentation or other similar processes. Today we can use modern pots and other utensils, and modern stoves. We also use rubber gloves to protect our hands. To control the dyeing process, various temperature and pH determination aids are used for research purposes. However, the wonder of discovering the unknown remains ever-present. Natural substances contain a great diversity, which is impossible to fully predict. The composition and quality of the substances in the plant have been influenced by many conditions, such as soil and climatic conditions during the plant's vegetation, the conditions of harvesting and storage of the plant, and others. The dynamics of the time and temperature changes of the dyeing process can also be variable. However, the process as a whole creates a living sense of presence.

Engaging in crafts is a way of "breathing life" into historical texts and obtaining information about the practicalities of craftsmanship skills, such as the required time, amount of work and resources, and more. The results of any experiment, including the first one, are meaningful and can be used as the starting point for further experiments and for acquiring new knowledge.

AUTHOR

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SOURCES

Abbreviations

E – Repository of Ethnographical Materials of the Institute of Latvian History of the University of Latvia.

LD – *Latvju Dainas* [Latvian *Dainas (tautasdziesmas)*]. 2–3. 1903–1906. Edited by Krišjānis Barons and Henrihs Visendorfs, Pēterburga.

LNVM ZAE – Archive of the Ethnographic Department at the Department of History of the Latvian National History Museum.

LTDz – Latviešu tautasdziesmas. 2–3: "Darba dziesmas" [Latvian folksongs. Work songs]. 1980–1981. Edited by Anna Ancelāne et al. Rīga: Zinātne.

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Ewa Klekot

Co-crafting the Meaning of Potter's Craft

Abstract

The article is based on ethnography and the autoethnography of making. It presents an anthropological reflection on pottery craft as a way of life in a 21st-century village in Poland. The individual case of a village pottery shop in the region of Masuria is in focus, a place located in the north of the country. The exchange of knowledge and a participatory mode characterised the ethnographic enterprise. The author's approach combines critical reflections on the social construction of *folk art and craft* in Poland with discursive renderings of craft-related bodily knowledge and the embodied recognition of materials and their affordances. Highlighting the alienating potential of the folk representation of the rural, it follows the meanings of pottery craft having been accommodated in the lifeworld of a modern village potter. The pottery workshop is presented both as an environment where skills and techniques are mastered as well as where experimentation happens and knowledge is built. The author focuses on recognising features of the world that are only made available through practicing the potter's craft. The craft is also a way of establishing meaningful links with the local environment of the potter.

Keywords: anthropology of making; pottery; bodily knowledge; Masuria; folk craft

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 32–59. https://doi.org/10.23991/ef.v51i1.142734

Figure 1. *Garncarnia* in February 2021, with the house to the left and the so-called old workshop to the right (photo: E. Klekot).

Late in January 2020, I received an email from an unknown female correspondent who explained that she had just attended my webinar on craft, design and embodied knowledge and that 'they' – she switched to the first-person plural – were extremely enthusiastic and interested in what I said. 'For almost twenty years', she wrote, 'we have been developing a pottery practice and our experiences and observations resonate so well with what you were saying!' 'We were not aware', she continued, 'of academic reflection being so much in tune with what we had been doing'.[1] My correspondent, enthusiastic about the connection between her experience as a potter and my discursive rendering of the processes, agency and knowledge involved in ceramic production, invited me to a pottery workshop located in a small village in the north of Poland, in the region of Mazury. She did not call it a 'ceramic studio', though, nor even a 'pottery studio', but instead used a slightly antiquated Polish word, *garncarnia*, meaning literally 'a village pottery shop'; only later did I realise that they used it as the name for their place, not only as a description of the workshop. *Garncarnia* can be both a place where the potter works and sells their products as well as a place where they live. However, due to the COVID-19 lockdown, I was only able to visit *Garncarnia* for the first time a year later, in February 2021 (see Figure 1).

1 The 'we' in this case refers to Marta Florkowska and Paweł Szymański, https://garncarnia.pl/, accessed 03/01/2024. I am in many ways indebted to both of them, not only as the protagonists of my ethnographic study, but also as generous hosts during my visit to their pottery homestead in Masuria, as the readers of this text and most importantly as friends.

Figure 2. *Garncarnia* in February 2021, showing the so-called new workshop with a wood-fired kiln. (photo: E. Klekot).

Since then, I have travelled to *Garncarnia* several times and spent my time there conducting an ethnography of skills and obtaining knowledge about pottery making, as well as accompanying Paweł and Marta in their everyday life, talking with them, sharing books and articles that I had published on the topic of embodied knowledge and skills and also on folk art and craft. Having practiced pottery for some time, teaching design students in courses co-tutored with a ceramic designer as well as during my previous ceramic-related research, I had already developed the analytical tools for understanding and putting into words the knowledge involved in ceramic manufacturing (Klekot, 2020, 2021a). However, it did not take long for me to realise that with Paweł and Marta, the research had become more of a collaborative enterprise than just my own ethnography of a village potter's craft in north-east Poland in the 21st century. Paweł has been very generous in sharing with me his insights about the pottery craft as his way of life, letting me observe him work, showing me some practical pottery tricks and explaining his findings: both about the properties of clay and about pot making, as well as about the place where he has been living. We also spent many hours talking about ethnography and ethnographic research on pottery, trying to understand the discrepancies between what he had read in books and articles and his/our pottery experience. The way the three of us participated in my research made me think of the methodology of co-designing, which I was already familiar with because of my position as an anthropology teacher at a design college. I had the feeling that understanding the contemporary sense and meaning of the potter's

Figure 3. Paweł Szymański at work in his pottery shop (photo: E. Klekot).

craft had become our common project. We were working it out together in *Garncarnia,* in a small village in Mazury, Poland, both with words and with practicing bodies, co-crafting the meaning, so to speak. An appreciation of the situated, relational knowledge that the three of us shared, combined with our different backgrounds and perspectives, resulted in many insights on all our parts, although it was me who put them into words. Having read my article published in a Polish design/architecture journal, Paweł wanted to discuss it with me sentence by sentence. In some places, my perspective was so different from his own that he almost protested, but then he accepted that seeing

the same things from various perspectives makes the picture richer. If craft means practices that are concerned with the production of objects and meanings (Mazanti 2011, 60), then I have crafted an ethnographic object in the form of this text because of the pottery-related, co-crafting synergy existing between the three of us. It is an ethnography of craft and making, embedded in an autoethnography of an amateur potter-cum-anthropologist and combined with critical reflections on folk craft in 21st-century Poland.

On folk craft and social distinction

During the COVID-19 pandemic, when I could not travel to *Garncarnia*, I spoke with a ceramist friend who had been my first pottery teacher and was also a fellow co-curator of an exhibition on craft at a design festival. She was a co-founder and an active member of the New Craft Association,[2] and when I mentioned my contact with the *Garncarnia* people, she remarked: 'Oh, they are *folk craft*, aren't they?' Here it was, the distinction. Classifying a craft piece, or its author, as *folk craft* means formulating a judgement of taste: a complex cultural tool for social distinction used in a habitus-based way and embodied as such (Bourdieu 1984). My ceramist friend left no doubt that in her opinion the *Garncarnia* people were not *new craft,* as she was herself. She based her opinion on their self-presentation on the *Garncarnia* webpage, which features their village workshop, their products and their activities.[3] However, the people from *Garncarnia* did not call their work *folk craft* either, even though Paweł Szymański had his own entry in a publication dedicated to 'contemporary folk art of the regions of Warmia and Mazury' (Beba 2008). In trying to find their own way of combining rural life with pottery handmaking, they had been struggling both with the concept of *folk craft* and with the open-air-museum-style reconstructions of so-called traditional techniques and their spectaclization. Nevertheless, their self-presentation was formulated in the sentimental poetics of an idyllic, simple life in nature, slightly anachronistic and escapist. The distinction between *folk craft* and *new craft* made by an art academy-trained ceramist catering to urban audiences – educated, lifestyle aware, mainstream contemptuous and trend setting (a proponent of the New Craft Association being *Vogue Living*) – was informed, on the one hand, by the complex history of craft within the modern field of art (Adamson 2007; 2013) and on the other by the long-standing relationship between the Polish intelligentsia and the rural makers of the objects identified as *folk art* and *craft*.

2 https://nownowerzemioslo.pl/en/, accessed 03.01.2024.

3 Only later did I realise that the potters from Garncarnia had been considering joining the New Craft Association but were discouraged by the response they had received to their inquiry.

Already in the nineteenth century, members of educated classes appropriated certain objects produced by villagers in many different regions of Europe for the modern field of art, submitting them to the judgement of taste (Klekot 2010; 2021b) and referencing them in several formative debates, most importantly those concerning the distinction between primitivism and ornament (Gombrich 1979; 2002). At the same time, folk art and craft became the foundation for folkloristic representations of the rural countryside, implicated both in the romantic search for authenticity as well as in romantic nationalism (Bendix 1996; Leerssen 2018). As a result, a lengthy process of the folklorisation of the rural countryside and its inhabitants was carried out by the educated classes, in which folk art and craft played an important role in how urban people conceived of the countryside as an archaic and picturesque rural world, charged with the power of primitive expression formulated in a distinctive *folk style,*[4] attractive because of its formal and social exoticism. The folklorisation of the countryside and its inhabitants – by which I understand the process of the modern aestheticisation of the rural (Brett 1996, 38–51), carried out in a markedly Herderian and Rousseauian mode, under the *aegis* of a distinctly romantic category of *the folk* – resulted in a selective approach to village life and its material culture because not everything produced in villages conformed to educated tastes for folklore and therefore deserved to be called *folk* objects. Such objects had to be knowledgeably selected from the contemporary village material, usually described by the selectors as having already been spoiled by modernity, a mere shadow of their pure, archaic state 'before first contact'. The creation of folk craft and art pieces has always involved interplay between the rural and the urban: the maker living in a village and the folk enthusiast of intelligentsia origin, responsible for identifying *authentic,* valuable *folk* objects and collecting them in the act of both safeguarding and canon-building.

In the process of preserving such *folk* craft, its enthusiasts (modern artists and designers, academics in several disciplines, collectors of various persuasions) dressed their own cultural creativity as an *act of discovery*, while the makers and their produce gained the status of having been *discovered,* under the condition that they had met the expectations defined through the construction of the folk. Such expectations were usually limited to the formal style – the *folk style* – and social origin of the maker (peasantry), implying their lack of education. Sometimes, they also referred to the moral and personal values

4 The style was in this context understood in an expressivist way: as the form in which a spirit of the times, or of a group, finds its expression. This understanding was influenced by Hegel and German idealism and was dominant in art theory and history well into the 20th century, but since then has been thoroughly criticised.

of the maker: honesty and sincerity, simplicity and naivete. Consequently, both folk art and the figure of the craft maker looked suspiciously like the *alter ego* of the modern artist (Klekot 2021b, 227–262), constructed according to the cultural representation-building practices described by Edward Said in his classic book on orientalism (Said 1978). Unrestrained in their expression by education, their creative practices followed community traditions, not individual whims; they lived close to nature and understood the natural beauty of simple form that follows function and the sincerity of the natural material, unspoiled by machine processing; they worked not for money, but because of a practical need, or for the joy of accomplishing a harmonious object – all these ideal features of folk creativity were extensively quoted both by modern artists, designers and art critics as well as by many academics studying the topic.[5]

In consequence, rural craft- and art-makers were encouraged to provide works and examples of lifestyles that met the expectations of the intelligentsia folk craft lovers. This could mean in practice the maker adopting stylistic choices that went against their own taste and the taste of their village peers, resulting in a process that I call self-folklorisation (Klekot 2024). As that happened, sometimes the village craft makers worked according to two different styles, catering to two different audiences, and providing two variants of their work: the one they called 'ours', which was destined for the local market, and the other they called 'folk', aimed at urban clients. The aesthetic qualities and stylistic features of folk products were ensured by educated experts: artists and designers on the one hand, and ethnographers/ folklorists on the other. They collaborated with organisations seeking to 'encourage the folk industry' by providing instruction to the peasantry in craft and handwork as well as assistance in how to market the products, thereby improving the living conditions of rural peoples. With the advent of a centralised, state-managed economy in the People's Republic of Poland after WWII, a state organisation for just such a purpose was established in 1949, which became widely known under the name of Cepelia.[6] It coordinated and supervised production and marketing in the entire 'folk sector', from the folk art and craft co-operatives operating in larger villages and provincial towns to individual village producers, from the so-called 'ethnographic and artistic commission' in charge of approving the products, designs and prototypes to tastefully designed retail spaces in the bigger towns of Poland and the world: e.g. Brussels, Paris, New York (Więck-

5 For an extensive analysis of the topic based on Polish-language sources, see Klekot, 2021b.

6 The name Cepelia is a phonetic abbreviation of Centrala Przemysłu Ludowego i Artystycznego, or Central Bureau of the Folk and Artistic Industry.

owski 1987, 155–158). To be sure, what qualified as 'tasteful' examples of art and craft was defined by experts on folk culture, or the intelligentsia.

The intelligentsia played a key role in the modernisation of Polish society, in the construction of a modern nation-state, and in defining the Polish model of citizenship. In modern Poland, as two Polish sociologists rightly remarked not so long ago, the ideal citizen was not 'a member of the bourgeoisie, as in Western Europe, or a gentleman, as was the case in Britain; nor was he a businessman, as in the United States, but a member of the intelligentsia of nobility heritage'. 'However', they note, 'since the beginning his nobility had been to some extent "appropriated" and artificially reconstructed in adapting to the needs of new, post-feudal social relations', meaning that 'in the first place, it consisted of good manners, refinement and culture'[7] (Smoczyński & Zarycki 2012, 211). Having appropriated the value system of the nobility, however, the intelligentsia presented itself – in contrast to the nobility and the gentry – as inclusive and democratic, supporting the emancipation of the middling classes. Nevertheless, in its vision of a modern society of equals, the intelligentsia was making extensive use of its cultural capital to construct social distinctions and hierarchies grounded in the judgement of taste. In the II Republic of Poland (1918–1939), the intelligentsia essentially made the national elite, grounding its status in its cultural and social capital, while in the People's Republic of Poland (1945–1989), despite the official, ideologically informed critique of social relations in the historic forms of Polish state, the narratives of popular culture 'naturalised the noble elite as the precursor of the elite of the nation' (Smoczyński & Zarycki 2012, 205). Therefore, because of the (self-) ennoblement of modern social elites, folk art and craft in the Polish context were not only implicated in modern mechanisms of social distinction but also provided such elites with an opportunity to re-enact the power relations underlying premodern social inequalities.

Similar processes of folk art and craft construction were part and parcel of European modernisation efforts elsewhere as well, but similarities can be misleading: modernisation processes were grounded in the social histories of nation-state elites, which differed depending on the country. Not only did differences exist between the intelligentsia's notion of an ideal citizen and a bourgeois culture builder (see Frykman & Lofgren 1987), but also the social origin of the Central and East European intelligentsia varied in different parts of the Russian, Austro-Hungarian and German empires. Pre-modern social hierarchies shaped the national and ethnic identities of modern Europe, and romantic nationalisms appealed to socially embedded value systems with a much *long(er) durée*. Even similarities between the 'people's republics' should

7 If not stated otherwise, all the translations from Polish are by the author.

not be overestimated, although elites everywhere in the Soviet bloc used folklore as a convenient tool for policing social and ethnic differences in the form of aesthetics.

The Polish intelligentsia in late socialist times (namely, the 1980s) became much less fond of the folk and the folk-inspired fashions provided by Cepelia. The visual language of its self-expression changed from the rustic, but elegant 'peasant style' of the 1970s into the 'Solidarity style' of the 1980s (see Klekot 2021b). The transformations of the 1990s proved fatal for the majority of Cepelia co-operatives, even though the organisation itself survived, transformed into a foundation.[8] The early 21st century saw an increase of interest in 'folk art and craft', both because of a strong regional bias in the internal politics of the country (as a result of the 1999 administrative reform as well as the impact of EU's promotion of pro-regional politics) as well as a generational change in the cultural production sector (see Klekot 2021c).

A village pottery shop in the region of Masuria

The region where *Garncarnia* is located has a complex history, one that has been especially turbulent and difficult in the 20th century. Its fate after World War II resulted from decisions concerning the Soviet sphere of influence in Europe: according to the Potsdam Agreement of 1945, the historical province of East Prussia was divided between Poland and the Soviet Union. Consequently, the territories experienced a substantial change in population: most pre-war inhabitants (2.33 million according to the 1933 census) either perished or fled during the final phase of the war, or else they were forced to emigrate between 1945 and 1947. In the territories under Polish control, the southern part of East Prussia, which included a population of 1.275 million in 1933, only 120 000 *pre*-war autochthone residents of Polish heritage, or the Masurians (*Mazurzy*), remained in 1949, with the total number of inhabitants in 1950 reaching barely 378 000 (Eberhardt 1995).

The new settlers were from various places, spoke different dialects, and sometimes different languages, differed in ethnicity and religion, and had dramatically different war experiences. As Sakson (2011, 212) notes: 'Some of

8 In January 1990, the parliament, while preparing a new legal framework for co-operatives, adopted a law that would put an end to Cepelia. However, already in December 1989, anticipating the legal measures being taken to put an end to the socialist enterprise, a foundation was established, with its statute approved by the Minister of Culture and Arts on the 29th of December. The following thirty years of Cepelia's existence, which are part and parcel of the social and economic history of the Polish transformation, reflected many of its delusions and all of its discontents. The last Cepelia-run shop closed in November 2020, following a long decline of the organisation itself, which is currently being liquidated.

them came willingly, others were coerced, travelling in rail transports guarded by soldiers and militia. There were people looking for opportunities of making up for the losses inflicted by the war that had left them stripped of everything (or freed from everything); and people who really believed in the mission of developing those lands, or people for whom they were an open treasury with no owners.' Roughly half of the settlers who moved to the former East Prussia came involuntarily: a substantial number of them were ethnic Poles from the territories lost by Poland to the USSR (ca. 143 000 by 1950, plus an additional 31 000 between 1956 and 1960); some settlers were also of Ukrainian heritage, resettled within the borders of post-WWII Poland in organised deportations aimed at 'fighting Ukrainian nationalism' (ca. 55 000); other, voluntary settlers (ca. 200 000 by the mid-1950s) were recruited mostly from poor and overpopulated villages in central Poland (Domagała 2015).

Painful memories of violence committed by different parties during WWII, silenced for decades if the perpetrator happened to be the Soviets or the Communist authorities (those expelled from the territories lost to the USSR were called 'repatriates', which denied their victimhood and obscured the coerced nature of their migration), combined with a foreign material culture, architecture and landscape, contributed to rather difficult beginnings. The new residents either occupied individual farmsteads or became workers employed on the extensive state-owned farms (PGR[9]), large properties confiscated from the Prussian gentry and transformed into PGRs. The number of state-run farms varied depending on the organisation recording them, but data from early 1990s indicates that just before they collapsed with the advent of the market economy, they had comprised approximately 68 % of agricultural land in the region.[10] The social cohesion of local communities was difficult to achieve, though; on the one hand, the Communist Party government imposed homogenising educational policies on both migrants and the autochthonous population, not leaving any room for unorthodox versions of Polishness, while on the other it suppressed independent civil society. However, despite the political transformation in the 1990s, a 2012 report found that 'the local communities of Warmia and Mazury'[11] still suffer 'the curse' of the eternal

9 Państwowe Gospodarstwo Rolne, or State Agricultural Enterprise.

10 http://encyklopedia.warmia.mazury.pl/index.php/Pa%C5%84stwowe_Gospodarstwa_Rolne_(PGR), http://encyklopedia.warmia.mazury.pl/index.php/Struktura_obszarowa_gospodarstw, accessed 05.01.2024.

11 The southern part of East Prussia, which became part of Poland after WWII, comprises several historical regions, the most important of which are Warmia and Mazury (Masuria); therefore, the voivodship, with its capital in the city of Olsztyn (located in Warmia), has been called Warmińsko-Mazurskie.

Figure 4. The pottery school being built, 2022 (photo: E. Klekot).

beginning, related to the foundation myth of 'arriving in a foreign land'. The Warmińsko-Mazurskie voivodship is still struggling with its 'non-defused history', into which 'the experience of less or more coerced migration has been inscribed' (Domagała 2015, 21). After half a century of silenced violence and failed promises of modernisation, the people of the region are still struggling to come to terms with painful memories more than a quarter century later.

Garncarnia is located in a small village, funded by a local landowning family named von Lehndorff, who operate a brickyard and a railway station, close to their family residence in Steinort (Sztynort in Polish), overlooking a lake and surrounded by a huge park. The village includes a derelict station building (no trains are operating), a couple of houses built in the 1930s for the brickyard staff and several blocks of flats built after WWII by the local PGR for its workers. In the early 1990s, Paweł[12] bought one of the houses, renovated it on his own and constructed a workshop corresponding in style with the house. Later, a bigger, new workshop was built, with a big, wood-fired kiln and a smaller electric one; recently, a building for a pottery school was added (Figure 5), financed with EU funding – all matching the style of the 1930s house, with a steep roof of red tiles, surrounded by an orchard, a huge mound of clay be-

12 I collected all the information concerning Paweł, Marta and the operations at Garncarnia during several visits between 2021 and 2023; my activities consisted of taking a course delivered by Paweł, observing him working at the wheel, interviewing him and Marta extensively, as well as sharing some of their chores, such as cooking or making apple jam.

Figure 5. The pottery school in closed shell state, November 2022 (photo: E. Klekot).

tween the house and the school, and some clay processing works and outbuildings containing different equipment. Paweł sourced the tiles for all the roofs on his homestead from demolitions of the pre-WWII buildings in the region, saving the tiles because he thought they were better than modern materials, as well as cheaper and more beautiful. He said he knew that the village houses built before WWII had been constructed according to politically motivated rules and plans for landscape design in Germany, but he appreciated the result, especially in comparison with both the post-war and post-transformation developments. Spatial chaos, resulting from war damage and post-war transformations of the former German lands combined with the consequences of the economic transformations of 1990s, has been a characteristic feature of Masuria (Musiaka, Sudra, & Spórna 2021), and Paweł has experienced such chaos all his life.

Paweł was born in Masuria, while both of his parents had immigrated there with their families after WWII. He graduated from a forestry vocational school but never worked as a forester. In the 1980s, he worked for some years on his parents' farm, where in the winter he used to deliver milk to the collection point on a horse-drawn sledge. Then, in the early 1990s, together with his first wife he started a small, local chain of village corner shops; however, his marriage broke up and he found himself with no job, a recently purchased old house requiring renovation and a teenage son to look after. At that point, he heard that a local museum in Węgorzewo (the nearest town) had received a grant to develop a pottery workshop and needed a potter. Paweł had no idea

about what pottery making entailed, but was always good at handiwork, especially carpentry, so he decided to go and ask if the museum would consider hiring a woodworker. The museum agreed on the condition that he enrol in a summer course on ceramics being taught at the museum by a couple of ceramists from Warsaw, and then he would have the opportunity to try and learn more on his own in the museum workshop.

The museum facilitated for him cross-border contacts and exchange trips to some Lithuanian black pottery centres. Paweł fell under the spell of Lithuanian potters immediately: the masculine community, keeping of trade secrets, vodka drinking and misogyny that were part of their lifestyle resonated with his recent life experiences. In Poland too, the village potters used to be men, but the region where Paweł lives did not have a strong village pottery community at that time, nor had the folk potters in Poland developed a strong sense of a trade community, which as a novice he found so appealing. He decided to become an independent potter and learn to produce black pottery. During the day, he worked for the museum, while in the evenings he built his own workshop and experimented with building foot-propelled wheels, new methods of processing clay and wood reduction firing. At the same time, he started collaborating with some archaeologists doing local excavations, trying to understand from an experimental standpoint the processes of forming and firing the earthenware discovered in the excavated burial mounds. He also dedicated a great deal of time and energy to understanding the characteristics of the earthenware pots so that they could successfully withstand the cooking of food in a hot open fire. At the same time, he mastered the technique of ceramic wheel throwing, trying his hand at many different forms, but with a special predilection for the fine, thin-walled, black-fired vessels, inspired both by the works of the Lithuanian master potters and by the late medieval black pottery he knew from museums, excavations and books. He also started offering pottery courses to students at his picturesque place of work. The instruction he provided was always tailor-made to the skills and needs of the (mostly female) students, who came from all over Poland: hobbyists, art students, urbanites looking for an alternative way to spend their holiday time or eager to learn new skills that would help them to change something in their lives.

In the meantime, an intern named Marta arrived at the museum and became interested in visiting his village workshop. She was a cultural studies undergraduate from the University of Poznań, and they shared a fascination with Lithuania and alternative lifestyles. Paweł built for her a special, low-positioned wheel propelled by a long wooden stick, inspired by Japanese wheels, and transported it to Poznań, where Marta kept it in a shared student flat. After she graduated some years later, the wheel came back with

her to Paweł's workshop. As part of the *Garncarnia* team, Marta has not only been a potter partaking in courses, presentations and experiments, but also served as a managing director, a communication officer and a strategic planner, with Paweł being responsible for the creative and manufacturing side of the operations as well as for programme execution and supplies. Since Paweł quit his job at the museum a while back, Marta is now also employed outside of their village pottery household, working in the NGO sector, currently as a manager and expert in the social economy. It was also Marta who reminded Paweł about listing products for sale via their webpage and about the need for more commercial orders. She recalls: 'The clients ask for his mugs and jugs, while Paweł, once he has gotten to know how to make something and mastered it, is no longer interested in it and looks around in search of new things to work on.'

Thinking through pottery

Craftspeople and scientists share a style of thought, claimed two Polish sociologists, *Łukasz* Afeltowicz and Radosław Sojak, a style that combines insights stemming from decades-long research within the area of science and technology studies and the history of science with their own empirical research on contemporary craft (Afeltowicz & Sojak 2015). Elaborating on the work of British historian Steven Shapin, especially his social history of science as a community of gentlemen, they pointed to the synergy between two socially different and yet key partners in the development of the experimental sciences, namely the gentlemen and the craftsmen. The synergy led to important changes in the practices of both groups and resulted in similarities in their styles of thought. This observation is in tune with what has become known in Scandinavian academic circles as 'craft science(s)' (Kokko, Alemvik, H*øgseth*, & Seitamaa-Hakkarainen 2020). According to Afeltowicz and Sojak, the social synergy contributing to the formation of modern science led to changes in the practices of both groups involved, resulting in similarities in their approach to practical solutions and physical tinkering with the equipment, an interest in the cognitive aspects of the enterprise and an appreciation of autonomy when acting (Afeltowicz & Sojak 2015, 194).

However, despite such similarities, acknowledging craft as an activity able to produce scientific knowledge has met with resistance in academia, as Norwegian philosopher Bengt Molander (2022) has observed. According to Molander, the reason for this resistance, still present regardless of extensive critiques of body-mind dualism, is a misunderstanding of the theory in science concept. Combining in his argument Kuhn's social critique of science with the phenomenological approach to cognition as a way of relating to the world and to the root, ancient Greek, meaning of *theoreia*, he concludes that 'there can be

as much theory in the crafts as in any science, with less words, perhaps' (Molander 2022, 231). To be sure, an understanding of theory as a cognitive tool strongly informing the practice and not necessarily expressed in symbols has been extensively discussed in the social sciences, but non-verbal theorising has only recently begun entering into academic discussions, first, and rather significantly, after having been reduced to the sensory register of the visual in the form of visual anthropology, and then in relation to practice-based master and doctoral degrees in arts, design and crafts.

Knowledge in pottery making is mostly situated and embodied (Klekot 2021a), and it is not possible to understand such knowledge without having direct and bodily engagement with the process. Undeniably, certain technological aspects can possibly be expressed through symbols, verbal or otherwise, or even formalised in equations, but most of the theorising in pottery involves practicing rheology. Through the material relation of manufacturing, the maker and the material transform each other (see Malafouris, 2013). The flow of a material, such as the clay on the pottery wheel, converts the maker into a rheology practitioner. When giving instructions, Paweł often repeats that throwing a pot on a wheel means pouring the clay between your fingers. The material used for throwing is a dense suspension, or fluid, being a mixture of different physical phases, with water constituting the liquid phase. The pot grows because the centrifugal force acting on the clay is stronger than the force of gravitation, while the position of the potter's hand influences the flow direction. The process of forming clay pots on the wheel is possible because of tixotropy, a phenomenon that characterises non-Newtonian fluids, with suspension being one aspect of it. Sometimes it is metaphorically called 'memory of the fluid'. It refers to the time-dependent shearing or thinning of the suspension fluid when stress is applied or hardening and softening of clay during its kneading and throwing phases.

Having finished a sequence of throwing movements, the potter reaches out to a small vessel kept nearby. The sludge-smelling, murky liquid – or slip – is crucial for the process of throwing, Paweł explains. It is not just dirty water that became muddy during the work and should be changed every now and then, as is done with water in a jar for cleaning brushes in watercolour painting. In fact, during the process of pot forming, the potter's fingers do not touch the clay material directly but operate through a very fine layer of the slimy fluid taken from the vessel, flowing between it and the wall of the pot being formed. Therefore, the pot is formed in the contact zone of two flowing suspension fluids, set apart by the solid fraction they contain and the size of its grain. Clean water would immediately filter into the pot's wall and changed the throwing properties of the clay. Moreover, the organic substances pres-

ent in the slimy fluid used in throwing – hence, its sludgy smell – add plasticity and facilitate the wall formation process. Thus, when the potter, having finished the pot, wants to cut it from the wheel head, they sprinkle the bottom of it with clean water, because sprinkling it with the sludgy suspension would make it more difficult to pull the pot from the wheel, as I know both from Paweł and my own experience.

Any description of the physical properties of the clay used for throwing is rather complicated because its non-Newtonian characteristics result in non-linearity. It is at this point where Bengt Molander's (2022, 223) observation that 'there are features of the world that are only available – or *made* available – by craft practices' rings especially true. Practicing rheology through throwing a pot does not require any abstract representation of physical processes. However, it is because of the rheologic properties of clay that the process of throwing on a fast wheel, one of the first devices invented by humans to scale production and improve its efficiency, cannot be automatised. The potter's clay is a non-parametric material. Industrial ceramic production exploits different technologies of processing the fluid material: it takes advantage of sedimentation processes, not of changes in the properties of a non-Newtonian liquid set in rotary motion. Certainly, you can throw a pot and use it as model for a plaster mould, from which you can make many similar vessels by casting or pressing. With throwing, though, only limited scalability is possible: you can change the number of potters and improve their skills and efficiency.

Paweł started theorising about his pottery practice almost since its beginning: observing and learning from observation requires attention and sensitivity to patterns, especially those that can be observed by the body but not expressed in words. Induction is the basic mode of arriving at a theory in craft. While mastering his throwing ability, Paweł also read books on geology, material science and anything he could find on pottery: the ethnography, history or archaeology of pottery making. He compared the theories he found in books with his own craft theorising. He was searching both for words to express his findings as well as for scientific explanations of what he had observed while working his locally obtained clay, throwing on a leg-propelled wheel of his own construction, equipped with an auxiliary engine repurposed from a washing machine, and firing it with wood in a kiln that he built in his yard. His close observation of the material behaviours and repetitive actions resulting from his embodiment of skills, his focus on minute details, his persistent detective work in finding patterns and hypothesising about the causal relations between what he had observed made Paweł at the same time a diligent researcher of his own craft and a consummate performer of it. Yet, becoming a pottery instructor required making his practical theorising more explicit. During his

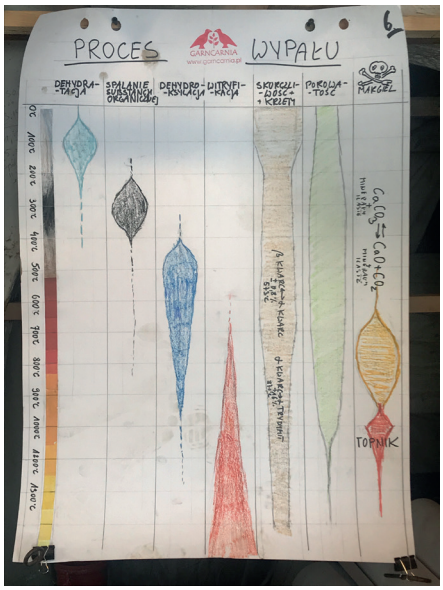

Figure 6. The firing process: a didactic material made and used by Paweł during the course (photo: E. Klekot).

teaching practice, Paweł developed a set of visual materials that he used while explaining parts of the processes to the students (Figure 6); for the sake of instruction, he also divided the processes of throwing, pot-making or pottery tool making into discrete steps that he was able to explain while showing them to the students. However, what he and Marta realised when preparing courses and teaching them together was that the words and concepts for describing the experience of pottery making and the experiential knowledge built into the process are lacking.

This was when we met. At the time, I had already been engaged for a decade in researching embodied knowledge in craft, especially ceramic production (Klekot 2020, 2021a). I had based my research on collaborating with both craftspeople and designers as well as with highly qualified workers in a porcelain factory. In terms of understanding embodied knowledge, skills and their acquisition, I had benefited greatly from my own experiences in ceramic making under the tutelage of some of my research collaborators. Being an anthropology teacher at a design school, I also co-taught courses with ceramic designers in our school's ceramic studio. Marta contacted me after attending a webinar that I gave on ethnography, auto-ethnography and teaching in the context of ceramic production. It was my attempt at rendering in discursive form an experience of knowledge that can hardly be abstracted from the body, that is situated and relational, sensitive to time and aware of patterned changes, quick in decisions and patient in waiting. In seeking a vocabulary that was at once evocative and corresponded to theorising about their craft, Marta and Paweł have since become especially fond of the term *mētis* that I used for the crafty intelligence of the potter (Klekot 2021a); they even jokingly remarked that the future pottery school they were about to start building should bear the name Mētis.

Paweł developed his pottery skills mostly on his own: the Lithuanian potters kept their secrets, although one of them, whom Paweł befriended, took

Figure 7. A pottery trick: drying a candlestick (photo: E. Klekot).

him on a 'formation tour' of black pottery makers, even though Paweł was never apprenticed to anybody. He studied black pottery in the museum collections, both historical and ethnographic, read about and searched for reproductions of pottery-related iconography, talked to producers of the folk *siwaki* style, or graphite grey pottery, from the nearby region of Podlasie, and incessantly experimented both with forming and firing pottery. On the one hand, he wanted to make pots suitable for cooking over an open fire, while on the other he was fascinated by the late medieval fine black pottery he knew from museums and publications. In studying these forms of pottery and trying to understand the logic behind them, he considered both their functionality and the features resulting from their production: their scale and economy and the economy of a potter's work. Never apprenticed with a human master, he took the vessels he admired as his teachers. His was a 'time-gap' apprenticeship – a concept coined by American archaeologist Marilyn Kelly-Buccellati – 'involving the rediscovery of skills from the past that were lost in the detail but remained alive in the general tradition of a given craft and were revived through the inspiration provided by objects made by previous generations. … Where there were no teachers, models had to suffice' (Kelly-Buccellati 2012, 204). However, with a time-gap apprentice, because through the process of emulating an absent master they are operating in a similar work setting, they are able to follow the same steps of a set production sequence, 'decoding both the explicit and the tacit information given by a study of the artefacts themselves' (Kelly-Buccellati 2012, 212). The process is not about making a historical reconstruction, though, but about learning new skills or methods and incorporating them into the apprentice's own practice, further developing and bringing new understandings to them, and ultimately making them part and parcel of the 'time-gap' apprentice's own repertoire.

Paweł offered the example of how the thin walls of jugs and mugs, proof of the maker's mastery, are at the same time both a functional requirement

Figure 8. In the 'old workshop': discussing the ceramic forms (photo: E. Klekot).

(lower weight of the vessel destined to carry liquids with one hand) and the result of economic thinking (less clay was needed for a thin-walled jug than for a thick-walled one). To be sure, the thinner the wall, the more mastery on the part of the potter was required, but according to Paweł's experience in acquiring master skills, the scale of production in a medieval workshop must have been the result of real masters capable of forming pottery on a fast wheel. In observing the traces left by his hands during production, Paweł on several occasions provided traseological insights for archaeologists. He also assisted archaeologists by assessing the level of craftsmanship involved in producing the vessels found in archaeological material. However, his relationship with archaeologists has not always progressed smoothly. On one occasion, he shrugged his shoulders in indignation at an obviously (to him) failed reconstruction of a medieval kick wheel published in an academic book, while on another he was ready to argue face to face with an archaeology professor, an acclaimed specialist in late medieval pottery, about his description of pottery techniques based on an analysis of pottery shards. Paweł's experiences with making the same ceramic forms and his analysis of the shards they produced led him to challenge the theory of a 'strip-sliding technique', as he was convinced that the medieval vessels supposedly made via such a technique had been simply thrown on a wheel.

Being a village potter in the 21st century

After Paweł had become a potter and started working at the local museum, the museum's director suggested that he join the Association of Folk Artists (Stowarzyszenie Twórców Ludowych). Since then, he has taken part in many folk festivals and fairs, both on his own and with Marta, mostly presenting their skills rather than selling any products. He continues to attend several summer folk or regional festivals and fairs in the region every year, presenting his pottery skills or cooking in pots of his making on an open-fire clay stove of his construction, mounted on a special cart. He does not sell his products, but he lets people try what he cooks and talks to the audience. Some years ago, when Marta used to join him, they travelled more often and much farther afield, sometimes taking with them two different wheels to demonstrate throwing techniques. It was Marta who initiated the therapeutic classes for children with special needs. Marta's favourite Japanese-style wheel allows the teacher to sit in front of the student, and she says that it gives her much better contact not only in terms guiding the student's hands but also for demonstrating the stable and poised position of the body. In throwing, the balance of the quickly moving clay is anchored to the potter's body, and so it is very important to keep the body stable while throwing. Marta's pottery practice seems to be more about being than making, and she appreciates the way it helps the body feel engaged with the matter of the world – both her own body and the body of the student she guides through the subsequent stages of throwing. Marta, like me, counts herself among the urbanities and former urbanities for whom their craft practice is about de-alienation and/or agency (Crawford 2009).

Nowadays, because of her job outside *Garncarnia* (she is professionally engaged in the third sector) and raising their young daughter, Marta does not take part in the trips, and Paweł only visits places in the region. From his perspective, the festivals are not the part of his craft activity that he is most proud of, but they bring in some income, so he keeps doing the work. However, after *Garncarnia* had been listed as a tourist attraction in locally published promotional brochures, the visits of vacationing families arriving in search of a folk potter turned out to be a really disturbing experience. He realised that the tourist audience was not interested in his work, or in the workshop he had proudly built and equipped with his own hands, but instead expected a folk pottery spectacle upon their arrival. Only then did he fully comprehend the painful difference between participating in a folk festival spectacle outside of his place of work and making his own workshop into a spectacle. At home, the alienating power of folklorisation proved unbearable.

Most independent practitioners – be they a potter in a village or a ceramist in a big city, an artist, a musician or a writer – have done work they would not be eager to include in their portfolio, even though they might have learnt

a great deal in the process and put some effort into achieving a satisfactory result. Such work does not fully comply with their judgement of taste. In the case of Paweł, this is the spectacle part of his activities, while his making is where his judgement is the most uncompromising and where he is not willing to compromise his expertise. The discoveries he makes and insights he gains while in his workshop are the most cherished aspects of his craft, and it is the fluency and economy of making combined with the compatibility between form and function that inform his choices. Teaching, which comprises some elements of display but is also embedded in the experience of making and of acquiring skills, occupies the middle ground. Paweł teaches techniques and processes rather than the making of objects, although the objects are the final result. This approach he shares with many contemporary craft practitioners, who instead of focusing on manufacturing objects for their (mostly internet) shops, concentrate more on delivering meaningful experiences to their students, following the demands of the experience economy. However, the construction of a separate school building kept Paweł so busy for more than a year that he hardly had time to sit at the wheel, so from a bottom-line perspective the decision to focus on education did not have an obvious benefit. The school, though, Paweł remarks, will make his mother finally happy with her son: Paweł will stop playing around and fiddling with mud and will have a decent, respectable job of being a teacher.

Once the student has mastered a technique, they can use it to make any objects they desire. However, one of the negative assessments that Paweł employs when judging the object being made is that it is an 'a-technical' (*atechniczny*) object, by which he means that the form cannot be inferred either from the properties of the material or from its formation technique. Not long ago, he received an inquiry from a designer who wanted to produce lamps with handthrown ceramic bodies and shades, fired black. 'But why to throw them?', Paweł asked: 'This is clearly a form for casting. Throwing it would be *a-technical*. And why would you want to make a lamp shade out of heavy black earthenware: this is *a-technical,* too.' The comments clearly convey his unwillingness to compromise his making-based judgement of taste. The viewpoint of the designer, as it was explained, was for the lamps to be 'handmade' in a literal sense: in casting, it is not hand that shapes the material but the mould. Paweł thought the planned object nonsensical from the standpoint of craft production.

The principle that form follows function sounds quite modern, and in Paweł's value system it can be combined with the idea that technique should follow the affordances of the material. Discovering the technical and/or functional rationale behind the form a vessel takes has always been gratifying to Paweł, like when he experimented with making pots suitable for cooking on a

stove with an open fire, before finally coming up with a reliable recipe for both the wall thickness and the correct proportions for the foot diameter in relation to the diameter of the body and its height. Since the practice of cooking over an open fire was still in use in many villages in eastern Poland before WWII, he fancied the idea that his wares were much better examples of *folk pottery* than the folk-looking pots sold at folk festivals, which he had never been interested in producing. He never painted his pots or decorated them, and quite early in his career he decided that he was not interested in glazes either. All this went, in his opinion, against the folk pottery style of the time, and he admitted that he felt awkward being called a 'folk potter'. Representations of the folk neither corresponded with the village reality he knew nor with the way of life that he had chosen. With his main inspirations being Lithuanian black pottery and late medieval vessels, he chose to produce forms that were functional, rather minimalistic and tactile: their aesthetics – as he explained – was the outcome of the production process and the most important tool he had – his hands.

The experiments with local clays and wood firing resulted in hues ranging from shiny black, via mat greys, to ochres of various intensity and shades. He worked with local clays, sourcing them mostly from different brickyards in the region. He brought the clay home and processed it himself, leaving it outdoors in his yard, piled in a small mound. The first stage of clay processing is done by the weather and the work of living organisms, from plants and animals to fungi, bacteria and other microorganisms. The exposure to colonisation by different living creatures results in a process that Paweł calls *gnojenie*, a traditional term that literally means 'dungification'. In explaining the process, though, he refers to soil biology and uses the term edaphon: in his opinion, the presence of soil biota is a crucial factor influencing the forming properties of clay. Another factor is the freezing and thawing of clay, which loosens the macrostructure of the material. The way in which the pottery material flows and thickens depends on its mineral structure, or the distribution and motion of clay mineral sheets in suspension. However, the presence of edaphon alters the material's rheology, improving it from the perspective of wheel throwing.

The process of 'dungification', Paweł explains, happens in nature, too. He has located a place in the forest where he sources small quantities of clay ready for throwing: it is a *paprzysko* (literally: 'a mucking place'), or a mud pool created and used by the boars. The 'living clay', Paweł says, feels smooth to the hand, more slippery than the 'dead clay', and 'even though you pour the slip all over, the dead clay will anyway feel like a fine-grained sandpaper'. Paweł has been working with materials sourced directly from several small open

mines, located in the brickyards, and one of them he found extremely suitable to his needs, or his taste, as he likes to say. Several types of clay might respond to the needs of a good potter, but not so many would correspond to their taste. A potter appreciates aesthetically the material not because of the way it looks, or even how it will look when fired, but because of the sensory pleasure it gives them while being worked. Here, aesthetics is a question of the senses, not some Platonic ideal of beauty. Once a potter has found their material match, they will not willingly exhaust the supply: with closure of the brickyard providing Paweł's beloved clay, he bought a full truckload of the raw material. The over two-metre-high mound behind his house, now situated midway between the house and the pottery school building, has become a favourite place for dogs to play, and Paweł is gratified that the animals also contribute to the process 'dungification'.

When working with his favourite clay, Paweł realised that some of the vessels had sometimes vitrified during the firing process, almost becoming stoneware instead of earthenware. Earthenware is fired in lower temperature than stoneware because most clays would *flow* (melt) very quickly; that particular clay, however, proved to have the potential of passing the vitrification point without immediately melting, although it could not withstand the vitrification temperature for long. Paweł conducted various experiments and arrived at a firing curve that works – to be sure, he worked with an electric kiln. With wood firing, he would not have been able to reach the necessary level of temperature and time control. He called his discovery 'Masurian stoneware', and the vessels made via this method, especially the mugs, proved a success with customers.[13]

In trying to make sense of his pottery practice in a 21st-century Masurian village, Paweł searched not only for local clays but for local pottery traditions as well. He wanted to know what kind of pottery had been used in Masurian villages in the 18th or 19th centuries, and so he consulted with local historians and archaeologists, and to less extent, with ethnographers: he was interested in the material culture of the common people, not in *the folk*. In his search, he came across a piece of information about a type of pottery created on the von Lehndorff's estate of Steinort, along the shore of Lake Mamry, in a place called Amalienruh, formerly a sentimental hermitage. With the help of a local historian, he identified Amalienruh on a late 18th-century map of Prussia, the

13 I played a small part in the product testing: it consisted of checking the mechanical dishwashing resistance of the earthenware, with the test result being positive, and thus the product proved to be dishwasherproof.

Figure 9a and 9b. The stamp of a 'time-gap fellow potter' and its impression (photo: P. Szymański).

so-called Schroetter's map.[14] It was only approximately 3 km from his house, but currently part of the Sztynort nature reserve. In a thicket in the reserve's forest, Paweł found the vestiges of brick buildings, and when ferreting among the moss-covered bricks and windthrows revealed yet more bricks and shards, he found some fragments of vitrified ceramic material that he thought might have come from a pottery kiln. The same local historian friend provided Paweł with data about the Amalienruh potters, coming from a potter family named Sensfuss, or Sensesfuss, active in Angeburg (now: Węgorzewo) at least since the beginning of the 18th century: Jacob Sensfuss (born 1742, potter master in Amalienruh since 1775), Gottfried Sensfuss senior (1782–1838) and Gottfried junior (1812–1888), who was a potter in Steinort (Florkowska 2006, 64). Meanwhile, at a local curiosities collector's home, Paweł came across a metal stamp with the name of a master potter from Steinort, Gustav Sensfuss (Figure 9a and 9b). It took him a great deal of time and cunning to convince the collector to part company with the stamp, which he had had no intention of selling. Finally, Paweł succeeded in purchasing the stamp in 2018, obtaining it in exchange for a sword that he claimed to have excavated somewhere in the fields (he had made it a couple of decades earlier, out of an old leaf spring, intending to copy a samurai sword). Since then, the stamp, possibly dating back to the first decades of the 20th century, has become one of Paweł's most cherished pieces of memorabilia. Apparently, it has established a link between the two local potters from Masuria, active in nearby villages within the timespan of three generations: Sensfuss has become Szymański's 'time-gap fellow potter'.

14 Karte von Ost-Preussen nebst Preussisch Litthauen und West-Preussen nebst dem Netzdistrict aufgenommen unter Leitung des Königl. Preuss. Staats Ministers Frey Herrn von Schroetteer in den Jahren von 1796 bis 1802, https://rcin.org.pl/dlibra/publication/12308/edition/829/content, accessed 10.01.2024.

Conclusion

Co-crafting the meaning of a village potter's craft in 21st-century Poland has been a methodological experiment that I have undertaken, profiting from my ethnographic craft already seasoned within the sphere of embodied knowledge research and inspired by collaborative practices in both anthropology and design. The experiment did present a challenge: while being (auto)ethnographically attentive to my potter part, necessary to grasp the experiences of Paweł and Marta and better share with them my own perspective, I found it difficult to be ethnographically attentive enough to my ethnographic role. I realised that quite often, I used ethnography as my 'way of being'. I felt confident in my craft of being a researcher working as a craftsperson, who, having mastered their craft, achieves a state of 'flow', hardly being able to say where their body ends and the material begins. We shared so many experiences during our pottery practice, and Marta and Paweł so often affirmed how I described them in written text that I started to feel that I was speaking for the three of us. Only later, when I was listening to the recordings of our talks, did I realise that the process was much more nuanced and that my mastery of the word-craft sometimes made me overhear the softer undertones of someone else's words. Also, when reading my notes later in the evenings, I was not always sure whether I was speaking for myself or for someone else. Usually, the recording helped, and I am glad that I had dutifully recorded our evening discussions. However, on some occasions in my different writings (this ethnography included), I have had the feeling that I did not know where exactly the wording reflects my own experience and where it reflects what Marta or Paweł showed me or told me about, or where even they possibly overlap, helping generate a description that resonated with the three of us.

Throwing pots on a wheel is a process that relies on a complex dynamic between gravity and the centrifugal force generated by the potter. It is based on an embodied understanding of materials in motion. It is a human-initiated relationship of making, in which the potter and the material mutually transform one another in the process of their material engagement (Malafouris 2013). In this engagement, the potter modifies the position and attitude of their body in accordance with the flowing material, directing it and making it into a new form: a form it has never taken before but which is in accordance with the material's propensity. The meaning of the potter's craft has also been crafted from a material in motion: conceptual and embodied knowledge, social distinctions, the judgement of taste, the folk craft, and the village in Masuria. It was the propensity to engage their senses that I had tried to follow in the meaning-making process, modifying my own understanding according to the lifeworld that I could share with the *Garncarnia* people, animals, clay mound

and its edaphon, the wheels, slip, the Sztynort nature reserve and all the other social actors involved in the meaning-making entanglements. In the process, the 'features of the world that are only available – or *made* available – by craft practices' (Molander 2022, 222) came to the forefront, and I hope their discursive form has been crafty enough.

AUTHOR

Ewa Klekot is a cultural anthropologist, translator and curator and currently a professor at SWPS University's Design Institute. She earned MAS in archaeology and ethnology and holds PhD in art studies and a *habilitazione* (post-doctoral degree) in cultural studies. She is interested in an interdisciplinary combination of liberal arts and social sciences with a focus on design and artistic projects, both in research as well as in education. Her current area of research concerns the anthropology of manufacturing and related cognition modes – skills, embodied knowledge, materials and processes – as well as manufacturing traditions versus intangible heritage. She also practanthropological reflection on art, especially the social construction of folk art and heritagisation through monuments and museum exhibits. She serves as a member of the City of Warsaw's Council of Intangible Heritage and is also on the Council of Monuments at the city's historic monuments preservation office.

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Linn Sigrid Bratland

Renovating Traditional Craft
Exploring the Potential of Craft as Part of Research

Abstract

This review article evaluates theories and on the entanglement of matter and meaning, elaborating and exploring the potential outcomes of craft in research processes. Exemplified through a collaborative exploration between me as a silversmith and programmers at the Mechatronic Innovation Lab (MIL) in Grimstad, Norway, I explore, through these theories, how renovation work served as a diffraction apparatus in exploring the relation between traditional craft and emerging mechatronic technologies in light of the concept of sustainability. Renovation work is, in this setting, understood as cutting, filing, grinding and polishing, often the final but nevertheless essential step in a production process. This type of surface work accentuates here how it is possible to not only see traditional crafts as carriers of intangible value linked to identity but also as a type of knowledge powerful of providing insights into the entanglement of matter and meaning. Through uniting different knowledge systems, like the subjective knowledge in the situated understanding of material, tools, setting and processes, and more objective knowledge, typically for observation, readings and purely cognitive activities, renovation work exposed, in this case, some of the limitations of automation and provided unexpected findings on the relationship between body and machine.

Keywords : Agential realism, situated knowledge, craft theory, mechatronic technology, traditional craft, silversmith.

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 60–80. https://doi.org/10.23991/ef.v51i1.138525

Introduction and research question

Several theoretical perspectives elaborate on the reciprocal relationship between cognitive and tacit understanding, materiality, space and social conditions. In this review, I assemble and elaborate on a selection of such post-modern perspectives connected to the concept of sustainability. Few of these perspectives use the term sustainability, though. Still, they share a concern for the contemporary global geopolitical problems. Throughout the Anthropocene, discussions have shifted away from human-centred and, some would say, even Western-centred perspectives. From this viewpoint, human relations, concepts and theories have never been isolated from the material world, and thus objectifying humans, land, animals or materials is fundamentally problematic.

To illustrate and reflect on the relationship between matter and meaning in light of the concept of sustainability, I relate this perspective to a seven-month collaborative exploration that took place in 2021–2022 between myself as a silversmith and the Mechatronics Innovation Lab (MIL) in Grimstad, Norway. *Mechatronics* is a field that combines mechanical machinery, electronics and computer engineering. In this case, we explored the potential of using third-arm robotics, virtual reality (VR) scanning, modelling and three-dimensional (3D) printing with precious materials, like silver or gold. Given the economic challenging conditions crafters now face (Abbing 2002; Mangset et al. 2018), we explored the potential of this technology in relation to the craft as part of the present consumption and production system. Through the practice of renovation work, understood here as the final step of surface work on the production line, the outcome and results of this comprehensive exploration were at first somewhat disappointing. The technology we tested appeared purely hypothetical due both to its cost and availability. Still, the challenge in essence a question of scale and resources. The most surprising result was how difficult it was to make the robot arm do satisfying renovation work and the amount of afterwork the print needed. The renovation work accentuated in this instance more limitations than possibilities when using and implementing this advanced technology. Due to growing awareness of social and environmental problems, stricter regulations, and generally tighter access to resources, I found it relevant to question the paradigm that solving economic challenges necessarily has to do merely developing and implementing new technologies.

A more detailed description of the research and its outcome will be presented in a separate article. So far, I have only an unpublished report provided by MIL and my own fieldnotes from the project, which I refer to here. In this case, I will elaborate on some of the theories that helped shape the project. Since this project dealt with technology and the production of knowledge, theories on the entanglement of matter and meaning became relevant because they enabled me to view renovation work as a potent component of not just gath-

ering data but also analysing and understanding the data in relation to the field of traditional silversmithing, and its relation to the system of consumption and production. – A system that are in the midst of fundamental change because of the growing focus on sustainable development.

Renovation work

Renovation work as a part of silversmithing practice is a term often used to describe the final phase of surface work, where the goal is usually to remove traces of a construction process. It can involve cutting cast tubes, grinding and polishing the surface, and so forth. Several technological inventions help make this process effective, but this type of technology only fits certain aspects of renovation work, though. Time-consuming, hands-on operations are often still required (Bratland 2023). The process objectively appears simple, and I have interpreted it as alternately an easy, tedious and almost insignificant activity and would be happy to let a machine do the work for me. The artist Barry X Bal's work, labelled an iconic example of what advanced new technology makes possible, illustrates the apparently insignificant but still vital role of this type of work. His bust, 'Envy', is an example of what 3D scanning, VR modification and 3D printing make possible. Still, the work required 2 000 hours of hand grinding to complete after the advanced technological creation phase (Bratland 2023; Johnston 2015).

From an etymological standpoint, renovating means making new again or restoring to a good condition (Etymonline 2021). The use of renovation work in the case described above and my experience with how this apparently insignificant part of the practice became a significant part of the research project ultimately changed how I approach and execute this type of work. My awareness of the activity was conceptually changed, or renovated, in the more etymological sense of the word. In this sense, renovation work became both a pragmatic and conceptual red thread in this research case.

The merging of theoretical perspectives and practice is grounded in my experience of working as a silversmith for more than twenty years. The general approach to understanding and using the different theoretical perspectives therefore necessarily had a subjective side to it. I found it impossible to overcome the fact that my personal engagement with and experience as a practitioner and my network in the field influenced my take on this case. Considering this situated perspective as fruitful and not an obstacle became crucial. I therefore searched for a way to unite the knowledge system of the craft with the more objective and systematic knowledge system typically pertaining to doing research in a conscious manner. The effort has been guided by the following questions:

How is it possible to unite theoretical perspectives on the entanglement of matter and meaning and the practice of traditional silversmithing in research?

What are the implications of involving the craft for understanding the relationship between traditional craft and emerging mechatronic technology?

The effort at unifying the different knowledge systems and theoretical perspectives will be the main focus of this article. However, first I will elaborate on how traditional craft, emerging mechatronic technologies and the concept of sustainability are understood in this setting.

Craft and technology

Scholars have recently expanded on the term craft to molded it into a more inclusive term, understanding as more than just the trade-oriented systemisation of special competence bound by strict law and regulations on how, where and by whom it is performed (Gamble 2001). Richard Sennet (2008) uses the term in his influential book *The Craftsman* as a way of explaining how it is possible to invoke reflective-making and creating principles for everything ranging from music and software development to art, handicrafts and more established activities associated with the term. To specify what I mean by craft in this setting, I add the word 'traditional' to help narrow the scope to just the type of craft that the United Nations Educational, Scientific, and Cultural Organization (UNESCO) specifically classifies as old and endangered practices, like woodcarving, blacksmithing, shoemaking tailoring, and so forth (UNESCO — Traditional Craftsmanship 2023). Due to my experience as a silversmith, which they also classify as one of the endangered crafts, I relate specifically to this field. However, it is possible to make associations between the theories addressed here and other types of crafts.

The relationship between art and craft is closely connected, with the meanings of the words often overlapping and used interchangeably. Several examples can be cited of how art, with an emphasis on creativity and originality and as a way of expressing and presenting meaning, plays a role in academic research (Loveless 2019; Lund 2021; Stewart 2010; Withagen & van der Kamp 2018; Ørbæk 2021). The concept of research creation especially accentuates this approach to science and emphasises the potential of letting research and art work in tandem (Candy & Edmonds 2018; Chapman & Sawchuk 2012; Loveless 2019). Still, despite the effort to expand scholarly understandings of practice, the systematic literature review 'Please stay, don't leave!' (Wahed et al. 2021) reveals how strong the focus on safeguarding intangible cultural heritage, including traditional crafts, remains. Although information technologies are considered a resource for 'educating' the perceiver and conveying and safeguarding the aesthetics of traditional crafts, proponents often view mechatronic technologies as a threat to traditional crafts (Wahed et al. 2021, 1731). UNESCO and official understandings of what is meant by traditional

crafts encourage practitioners to safeguard their activities because such activities help preserve intangible aspects linked to identity (UNESCO — Traditional Craftsmanship 2023). Since the official definition of traditional craftsmanship focuses on preserving and safeguarding, associations with a de-activated objectification of craftsmanship, where the focus is *on practice* rather than *in* practice, and suggestions that this type of activity is passive and defined by others are at the heart of such understandings.

As a silversmith, I feel that many of us operate in a landscape existing between art, design and production, with as many variations in how the craft is executed as there are silversmiths. Still, throughout my years of practice, I have encountered how differently the activities are considered depending on the setting. I often emphasise work where I develop independent designs and focus on individual concepts and ideas rather than create something that is more or less standardised, like traditional brooches for folk costumes, standard wedding rings or making what someone else has designed. Like renovation work, the part of our craft where I have to set my own agenda aside and submit to something or someone outside my self seems an insignificant part of our craft, even though in my experience it is often as challenging as working in more individualistic ways, not only technically but also in terms of reflections and communication. Whether I have considered some parts of my practice as not equally potent of generating insights touches on the question of whether intellectual knowledge always takes place before action (Blackman 2012; Kuijpers 2019; 2023) and how we rank body and mind in contemporary Western society. The case that I elaborate on in this article demonstrates how various perspectives on material agency and agential realism, with its focus on relationality between matter and meaning, enable a view of the crafting process not only as an object or a neutral tool for conveying concepts and ideas but as an intra-active subject in the generation of knowledge.

Sustainability

According to the United Nations, sustainable development goals (SDG) concern social, economic and environmental issues and actions taken in one area will affect outcomes in others (United Nations Development Programme 2023). This definition corresponds to what several scholars highlight as the risk of solving isolated problems when striving for sustainable development. Phillip Kitcher, in his book *The Ethical Project* (2011), argues that objectivity and striving for the betterment of humanity often benefit individual nations or those in power at the expense of others, noting that we often, by isolating and solving one problem, create numerous of others. This complex dilemma makes navigating the SDG a balancing act between often contradictory elements,

and successfully managing them can appear impossible. Several scholars concerned with perspectives on sustainability in art, design and craft, encourage us to focus on the interrelationship between nature and the environment as a means of managing this balancing act (Clarke 2013; Kjetil Fallan 2019; Papanek 1985; Joey Graceffa Vlogs 2012).

Throughout the Anthropocene, which illuminates the totality of human impact on geologies and the ecosystem as a whole, it is easy to consider humans, the Anthropos, as the cause of all the problems we face today. Donna Haraway, though, introduces a sense of hope to this understanding by suggesting the use of terms like Chapitalocene and Plantationocene to point to the fact that humans as a species have not caused all the world's problems. Although we are all part of the Anthropocene, we are not all experiencing it or engaging with it in the same way. Several examples exist of humans living in more dynamic relationships with their surroundings. It is rather the systems of capitalism and objectification of humans, land and materials as merely resources for human prosperity that cause the problem (Haraway 2016, 30–57, 99–103).

This ontological baseline for the relationship between the human and more-than-human world affects our approach to research and what researchers consider fruitful perspectives on knowledge and knowledge production when employing the concept of sustainability. Theories questioning various perspectives on knowledge, the distinction between object and subject as well as the distinction between culture and nature become a part of the logic of sustainability because of the need for fundamental change, namely change in how we do research, and an awareness of the potential for making valuable contributions in other systems of understanding and ways of relating to materials and the environment (Finstad & Skjølsvold 2015; Grant Glass 2020; Haraway 2019; Hofstad & Delsett 2020; Krukhaug 2007; Lutnæs & Fallingen 2017; Sencindiver 2019; Stakemeier & Witzgall 2018; Sundby 2017; Ingold 2015; Smith 2012).

Theoretical building blocks

The perspective on relationships lends itself to an interdisciplinary approach that considers the practical knowledge of a craft, like silversmithing, as equal to knowledge of mechatronics, culture and even philosophy. Scholars like Tim Ingold and Bengt Molander point to how it is inevitable then to consider practical or embodied knowledge and theoretical knowledge not as the same but as equally valued knowledge (Ingold 2013; Molander 2015). As Ingold poetically notes, 'We must tip the hourglass on its side; knowledge does not necessarily run top-down' (Institute for Northern Culture 2013).

In this manner, I draw from scholars like Bruno Latour, Tim Ingold and, more specifically, Donna Haraway and Karen Barad, as they explicitly describe how art and craft carry a potential to close the gap between science and the material world. They suggest implementing other types of knowledge to empower a sensibility to the entanglement of matter and meaning in research (Barad 2007; Haraway 2016; Ingold 2013; 2015). Such perspectives accentuate how we are in a symbiotic relationship with the more-than-human world, with living, breathing organisms, minerals, elements and plants, whether in the form of robotics, software, wild wolves, domesticated dogs, refined silver sheets or a tree in the forest. Donna Haraway, from the field of biology and technoscience, has adopted the notion of 'companion species' in arguing for the value of tuning in to our relationship with 'species' of the more-than-human world in research and how they work in companionship with us (Haraway 1985; 2003; 2007). In relation to the project at MIL that I referee to here, I have therefore considered the tools, technologies, materials and settings as not just research objects but as companions in the project.

Situated knowledge

As a crafter, I find it easy to grasp arguments emphasising the potential of building craft knowledge into academic research. I have therefore tried to figure out a way to find and make use of the symbiotic relationship that Latour, Haraway, Ingold and other scholars talk about when screening and testing robotics and 3D technology in relation to traditional craftsmanship. The goal was to build on their holistic encouragement to shift perspectives on knowledge creation and not merely fall into the trap of solving isolated problems 'inside the box'. Still, I have tried to keep Donna Haraway's warning in mind. She calls attention to the risk of romanticising the 'otherness' of knowledge creation when conducting research based on such a perspective. She therefore encourages researchers to consider subjective knowledge in research because of the potential for unexpected openings and connections made possible by what she calls situated knowledge (Haraway 1988, 590). I find this warning highly relevant since it is crucial to remember that the research case I deal with here is not a study of traditional craft, like silversmithing, for its own sake. The focus is on change in the field of silversmithing in relation to complex systems involving technology, innovation and policy.

Donna Haraway describes how drawing insider–outsider boundaries as a means of understanding knowledge are really only theoretical power moves and not moves towards truth. She asks how we may find fruitful ways to integrate subjective knowledge based on bodily experienced understanding without entering the trap of focusing on the binaries of objectivity versus

subjectivity, outsider versus insider and so forth (Haraway 1988, 576–578). Bodily experience-based knowledge and its relation to space and materiality are what she describes as situated knowledge — a type of knowledge that is about communication and relations and not about isolated individuals. For Haraway, this type of knowledge does not stand in opposition to science. Still, situated knowledge requires picturing the object of knowledge as an actor and agent in the social relationship of conversation; consequently, it must also play an active part in research (Haraway 1988, 592–593). I have found Haraway's use of the term situated knowledge relevant for this case because it works as a model for thinking about traditional craft and the entanglement of matter and meaning as well as the social and material aspects of the trade, in a project like the exploring, screening and testing mechatronic technologies. Since situated knowledge is subjective, Haraway describes how it is necessary then to find what she calls our own 'semiotic technologies' (Haraway 2019, 60). By 'semiotic', she means, from an etymological standpoint, the systems of signs and symbols that comprise both artificially constructed and pragmatic issues (Merriam-Webster 2022). With respect to the semiotic technology used in the analytical phase of the project at MIL, I have found Terje Planke's use of the term theory in relation to craft useful.

Craft theory

Terje Planke writes about theory in relation to craft to describe the combination of thinking and making and the symbiotic relation between such activities in the craft itself (Planke 2001; Planke & Lorentzen 2022). I find his description of the knowledge *in* craft serves as a bridge between Haraway's perspective on situated knowledge and the particular project of silversmithing and mechatronic technology. Planke has written extensively about how knowledge for a crafter exists and changes in close relation to, for instance, processes, materials, tools, the society of crafters, laws and regulations, customers and economic actors. He calls this entanglement of process, material and meaning "*the crafts theory*" (Planke 2001; Planke & Lorentzen 2022, 250–257). However, use of the term theory in this respect also blurs the distinction between empirics and theory. Planke draws from Michael Polanyi and Bertel Rolf, but also from independent writers like Jon Bojer Godal (Godal 2021; Godal et al. 2018), to develop and describe his perspective on the knowledge system used in craft by focusing on a community of boatbuilders in Norway (Planke 2001). Planke expands here on Michael Polanyi's term tacit knowledge (Polanyi 1966). Tacit knowledge is, in the Scandinavian countries, often translated as 'taus', an unspoken knowledge connected to the tactile sensorial understanding of process and materials and *how we* know just as much about *what* we know. He

emphasises how Polanyi's term builds on an understanding of language as a tool and that our knowledge does not exist in the tool alone. The scope of our knowledge always exceeds what we express verbally or symbolically (Planke 2001; Polanyi 2000, 10). Still, in much the same way as Haraway describes situated knowledge, Planke also includes the craft's subjective social component. Together with the tactile side of knowledge, this perspective accommodates the connection of craft not just to materiality but also to location, tools, mentors, customers, colleagues and other relations that influence and shape understandings and execution of the practice.

Planke discusses the subjective social component of the craft by referring to how the boatbuilder must understand both the materials and the tools he uses to build the boat, but also the sea, the fisherman, who is the customer, as well as his tools, needs and desires, and the economy, not to mention the society of other boatbuilders and so forth. He also explains how this complex understanding of several aspects, *the crafts theory*, is communicated through a mix of stories and key statements spoken and conveyed in an interdependent relationship with process and materiality, as something that becomes situated in each individual and only fully understood when the actors have a type of shared understanding of the setting. Traditional craft, from this perspective, is about product, shape and functionality, but it is also about understanding context and relations (2001, 2, 307–312). Planke underscore this point by describing how boats, taken out of context, are often only judged by their aesthetics and visual beauty and how such an understanding of a boat is not only insufficient and deficient but outright dangerous and, in the worst case, even fatal. Like Haraway, he therefore encourages shifting focus from the safeguarding and conservation of processes as objects to the potential of incorporating analytical practice *in* the craft rather than *on the* craft (Planke & Lorentzen 2022, 249).

Though how we make and create jewellery is not as directly fatal if we do not understand context as that of a boat, our crafts' connections to the system of consumption and production are real. When the 'waves' of this system change fundamentally in light of the concept of sustainability (Pedersen & Jørgensen 2018) Planke's emphasis on understanding context becomes relevant. Planke's use of the term theory in this setting works as a semiotic technology that enables a consideration of the knowledge in the craft as an equally valued building block with which to build new knowledge. In combination with Haraway's erasing of the distinction between subjective and objective knowledge, it is also possible to build this type of knowledge into activities like reading, observation, reflection and writing, those aspects of research that I am conventionally more used to calling theoretical knowledge.

Agential Realism

Together with Planke's 'Craft theory', I find Karen Barad's notion of 'agential realism' a useful semiotic tool for seeing the potential of a craft like renovation work in particular. Barad elaborates on the relationship between human and more-than-human by introducing the term intra-action (Barad 2007). She hyphenates the word to both elaborate on Bruno Latour's Actor-Network Theory (ANT) (Barad 2003; Latour 2005) and describe what she means by actors as not just being preset separate entities interacting with one another but as participating in a constant dialectical remaking process in the void that exists between actors (Barad 2007). Barad talks in several of her publications about 'the void' being at the centre of the process and how it is never empty (Barad 2003, 2007). It is relevant to remember that Barad is a physicist, and so her understanding of the void is shaped by such a scientific perspective. The field of physics generally focuses on such building blocks of materiality as the atom and the void, where the void is the nothingness between components. She exemplifies the potential of the void as concept by referring to the splitting of the atom and how the void can also represent more than just nothingness. It creates room for numerous possibilities (Barad 2003, 806; European Graduate School Video Lectures 2018). Barad uses Donna Haraway's 'diffraction pattern' metaphor (Jamison & Haraway 1992, 300) to explain how scholars need to rethink 'the geometry and optics of relationality' (Barad 2003, 803). A diffraction pattern describes what happens when waves of light pass a corner, an opening or a slit, hindrances of a sort that she refers to as 'the apparatus', which changes the formation of the waves (see Abramowitz & Davidson 2022). In the metaphor, 'the apparatus' may just as easily be a philosophical idea as a material tool. Just as the atomic bomb would not exist without the theory on the splitting of the atom, neither would such a theory be conceivable without the physical possibilities of the atom. The material and meaning — the thinkable theoretical concept — 'intra- acts' and create the phenomenon. Relationality in this case may be the relationship between matter and matter. However, it may just as well be the relationship between matter and meaning, as concepts influence material processes just as material phenomena influence concepts.

In this manner, Barad's connection to Niels Bohr and quantum physics (Bohr 2005) blurs the line between mind and matter and renders her theories materially visible mechanisms as well as philosophical ideas in such a manner where matter becomes concept and concept becomes matter. Barad calls this process 'the entanglement of matter and meaning' (Barad 2003, 802). Her theories accentuate in this manner how a holistic perspective on culture and nature is both physical reality and abstract theory, and her use of the term 'ap-

paratus' makes it possible to think about renovation work, in my case, as both a physical and conceptual part of my research. Thinking of and working with renovation work in this way is what enables me to find new perspectives and relational outcomes rather than adhering to the binaries of traditional craft and technology, and it likewise enables me to find other findings that I would not have discovered if purely focusing on isolated processes and objective analysis.

Another voyage through matter and meaning

Karen Barad's theory of agential realism and her attention to 'the void', the space between actors, and the relation between the material and the thinkable (Barad 2003, 2007) creates an awareness of the relationship between technology craft and meaning. If what and how we think talk, or write about the notion of intra-act in relation with the craft, and the action itself, what we do in direct entanglement with the materials and the tools, informs how we think, write and talk, then neither of these activities is neutral. Knowledge is then not only based on theoretical, abstract intellectual activities, like observation, measuring, reading, thinking, analysing and writing, but also on physical engagement with the materials. Consequently, an awareness of *what* material is involved in such intra-actions and *how* it is implemented becomes relevant.

Based on this perspective, I found it possible to cut through the prejudices that thought always take place before action and that parts of the practice consist of mindless activities, like tools solely capable of canalising my predetermined concepts and ideas. I became open to the possibility that something exists in the processes, in the relationship between me, the tools and the raw materials, that is unfeasible through purely focusing on intellectual, conceptual work and objective studies. Letting go of the prejudices made me consider renovation work similar to the 'apparatus', which Karen Barad calls the opening that diffracts mind and matter in the research process. I therefore made room for this activity throughout the exploration of mechatronic technologies at MIL through the idea that it would contribute to the research outcome, even though I had not determined what role it would play on beforehand. However, finding this model for thinking with and through the materials in this research project grew out of being open to the unexpected, to use Haraway's term (Haraway 2016). I had to experience it to truly understand and become aware of such actions in an intra-action sense.

The insignificant becoming significant

Since many production processes in my practice have been automated, renovation work is an activity I spend much of my time doing in the workshop. To begin with I viewed the activity much like a 'walk in the park', as an easy distraction, when I needed a break from theoretical reflections, writing and

reading. As the project grew, however, it became clear that the hours of distraction did in fact influenced the research process and my understanding of it in specific matters, and vice versa. The perspectives affected my consideration of the process that we were testing in the lab facilities at MIL. Perspectives on the entanglement of matter and meaning caused me to open myself to the possibility that activities I had considered less significant might have to do with the society that I am part of and not the action itself. As a result, I began working on renovation work that naturally followed the situation of running a small-scale craft company, while making preparations, in between experiments and while doing the analysis, thus keeping the work attuned to the society of which this craft is a part. Due to variations in the research process, the flow of the renovation work was not totally systematic; rather, it followed closely alongside the research project, lasting between one and two hours every day.

When looking at the collaborative project done at MIL, it is interesting to see how this activity started to affect the direction of the process and analyses of the empirical findings. The collaborators at MIL and I, were concerned with the practical aspects of the project while doing the lab work. The testing and screening phases provided an overview and understanding of the potentiality of the selected technologies — possibilities in terms of time and rationality. However, by being open to the subjective relationship between the technology, my body and the surface of the silver, as well as the setting of doing renovation work as a crafter, I let this apparently simple process guide the experiments.

As described above, I experience renovation work as both a tedious and simple activity. Describing the process also makes it sound like a simple mechanical task. Therefore, both the collaborators at MIL and I believed at first that it could easily be done using robotic technology and considered it mostly a starting point for us to build a shared understanding of the potential of such technology in relation to the craft. Therefore, we were surprised to find that renovating a cast was a very challenging process for the robot arm. We started to rewind the process, to split it up, and ultimately started with simpler tasks, such as pic and place, to complete the task. Even then, though, it was challenging to recreate precise polishing tracks because, as it says in the report, *'these are fine movements which require a great deal of precision'* (Settendal 2022). The tests where we made VR models and 3D prints using the precious material were also somewhat disappointing. Although this technology provides an opportunity for seemingly endless visual and conceptual possibilities, our focus on the renovation part accentuated that materializing the design is far from merely a keystroke. The printed surface and the scaffolding demanded a large amount of renovation (Settedal 2022). Renovation work made me ask questions about whether the work really had the potential to benefit from less

expensive and research-demanding construction processes. I know that construction work done through hammering and chiselling, as but one example, demands hardly any afterwork. However, such processes do demand hands-on material skills rather than programming skills (Fieldnotes 2022).

It is not possible to conclude whether 'teaching' the robot to do the simplest of crafting processes is really about precision or whether it has to do with more complex issues, and whether VR modelling and 3D printing promised to be a shortcut that turned into a detour, just by looking at the cases alone. However, by attempting to find pragmatic solutions to economic issues, the theories on new materialism, agency and tacit knowledge suddenly became more than just abstract philosophical notions. The findings illustrate the potential implications of letting parts of the craft play a role in the research process. However, the principles of renovation work also intra-acted in my analysis. Analysing the lab results only based purely on economic interests in an objective and framed manner, boils down to scale and access to resources. Opening the results to broader perspectives on ecology, materiality and the intra-action of matter and meaning from an approach where there is room for more than just objective and framed measurements reveal a more complex picture. My numerous hours spent doing renovation work influenced the selection of processes and, consequently, also the empirical findings. As I started to give this activity more room and attention, I became aware of how the principle of this craft, as I experienced it, started to colour my analysis as well.

Renovation and surface work emphasise a focus on details, but also how the details also affect the whole. Every pore, hole and trace of the tool says something about the whole piece of work, and although they may appear insignificant compared to the construction and shape of it, they disturb the overall impression. Sometimes, they also indicate a weak point in the finished item. Grinding into a pore can open bigger holes and problems than what is evident on the raw surface, indicating weaknesses that can cause significant problems in the long run.

After the lab period, I kept returning to small details that we had ignored as we conducted the screening and testing phases, re-reading notes from my logbook that were not a part of the test report. One such note said that we were supposed to test a more advanced robot, but did not have access to it, followed by a comment on the outdated robot arm (Fieldnotes 2022). Much in the way that we often do renovation and surface work without paying too much attention to them, I kept returning to the seemingly minor observations not deemed relevant enough to include in the findings put in the report. With respect to Karen Barad's notion of agential realism, the entanglement of matter and meaning, and her focus on the void (Barad 2003; 2007), such 'insignificant' moments appeared interesting as an alternative perspective on

analysing the lab work. Although Barad applied her theory to an analysis of nuclear test bombing and quantum field theory (European Graduate School Video Lectures 2019), entirely different empirical material than the robotic, 3D scanning and printing of jewellery, her ideas made me aware of the entanglement of matter and meaning as somewhat relevant in terms of analysing 'the in-between moments' encountered during the lab work. If the void, the space in between, is a potent space, then the apparently insignificant parts of the lab work may still carry the potential for insight.

Time and materiality

The MIL lab's explanation for why we did not gain access to the robot arm that we had first wanted to implement in the tests was due to a global lack of the material silicon (Fieldnotes 2022). Silicon, processed and used in semiconductors, is vital to all digital equipment; still, the global situation does not allow for limitless technological expansion. Software development blurs the line between our virtual and physical reality, and it is easy to ignore the fact that this development is at the mercy of materials and the possibility and knowledge of mining, refining and processing the material to make the components used in microchips in everything from Tesla cars to virtual glasses and smartphones (Bratland 2023). I find it easy to consider the old-school tools connected to the holistic perspective on culture and nature. However, Barad's perspective on time and representation, nature and culture highlights how an understanding of the connection between artificial intelligence and materials also makes it possible to relate this technology to the bigger picture.

Having an understanding of what tools are made of, how they are made and how long they might exist in the form of a tool before they return to being just materials is different than just knowing about the technical aspects of low-tech tools. Some of my oldest tools, for example the chiselling hammer that I inherited more than twenty years ago, are simple constructions made from wood and steel. I can understand how the hammer is made; I have repaired it occasionally, and if it breaks, I am able to make a new one myself out of scraps from the local garbage dump.

As previously mentioned, one of the implications of Barad's perspective is that it affects how we may consider time, representation and questions of identity. I am not a silversmith; it is just a practice that I perform. Barad's perspective on performance emphasises that identity is not something fixed, something that one is, but rather, it is something transformative (see also Butler 2004, 204–205), I *am* not a traditional silversmith, but I work in a dependent relationship with the raw materials and the tools, just like my collaborators at MIL, although the tools are different. It is easy to think of traditional craft and mechatronic technologies as existing in a dichotomous

relationship. Being a silversmith comes with a strong sense of responsibility, as the history of the craft tends to focus on the loss of something valuable from the past that we must preserve (UNESCO — Traditional Craftsmanship 2023; Wahed et al. 2021).

Still, Barad's perspective shows how 'traditional craft' and 'technology' can be considered multifaceted, intertwined and constantly transformative terms. The tech developers and programmers at MIL who I collaborated with in the experimentations have a similar understanding of advanced technology as I have of my low-tech tools, like the old hammer. They also work in a dependent relationship with materials and sociocultural conditions, though they are encouraged to develop rather than preserve. Situated knowledge does not necessarily have to do with low-tech craft. However, 3D scanning, printing and robotic technology are more dependent on the global market of material supply.

In another note from my logbook that I kept returning to, the lab workers explained the third-arm technology to me, with one of them saying the following about the robot arm in the lab: 'This is from 2018, but that is okay (apologising it for being old and outdated at this point in February 2022) — it is with the software the development happens rapidly' (Fieldnotes 2022). The statement was at first difficult for me to relate to, as I have an almost personal relationship with my tools; they even gain in value as our 'relationship' grows.

To think of a phenomenon as transformative, via Barad's perspective, interferes with the most common linear perspective on time as well as identity and representation. Through this lens, it is possible to consider technologies not necessarily as emerging. From an etymological standpoint, transformation relates to the term change, and change is slightly different from the term develop. From a linear and representative perspective on technology, it is easy to think in dichotomous terms, as in something emerges and something else becomes 'outdated'. We can laugh now at those who considered the spinning wheel demonical and dangerous when the technology was new (Hoffman 1991, 68), because now we see the technology as traditional. Rosi Braidotti and several other scholars from the field of technology studies warn about engaging in nostalgia when it comes to technological developments (Braidotti 2017, 23–24). Still, I find that the linear perspective on technology makes it hard not to engage in nostalgia at times. Even Braidotti often refers to how the 'human' gets 'wiped out' in relation to what she calls 'Zoe' — a short-hand term for the more-than-human world in the form of artificial intelligence, robotics and machines (Braidotti 2017, 28). Still, I do not experience this idea as something new.

My saw, and the two pliers that I bought as an apprentice, feel like extensions of my arm when engaged in such practices as renovating a cast. The saw has always been a little crooked, so it draws slightly to the left, but I am so

The renovation work at MIL. Photo: Gudrun Semons.

used to it that I am only aware of the quirk when I occasionally use an unfamiliar saw that happens to cut straight. When aware, I can feel the surface of the silver through the tool. In such instances, it is also hard to draw a line between me as a human and the technology, although the technology is old. To consider technology as transformative and not necessarily as evolving, I find it easier not to become caught up in nostalgia and wish for a return to some unfeasible glorious starting point, losing myself in the sense that something is constantly slipping out of my hands — or, on the other hand, just mindlessly celebrating innovation for innovation's sake.

Barad (2003, 808) suggests that performativity is linked not only to the formation of the subject but also to the production of the matter. In this case, it is possible to use Barad's perspective to let go of the mental effort of seeking either to preserve or to develop. Her perspective makes it possible to consider technology as a phenomenon in constant flux regardless of our back-and-forth efforts at categorising it. Letting go of the binaries enables a sharper focus on some key values regarding sustainability and striking a balance between the economic, ecological and intangible aspects of the technology.

Even though we were not able to make the robot arm cut and grind the cast tubes, and even though the latest printing technology did not deliver a perfect surface, eliminating the need for any after-work, we could not conclude that the effort was wasted or that fully automate renovation work will never be possible (Settendal 2022). Still, in light of Barad's perspective on the entanglement of matter and meaning and how such a relationship is always transformative, the question is, just what is being transformed here? Yes, we can develop technology in a laboratory, technology that may save some time and effort, but at what cost? What are the implications outside the laboratory?

If programmer at the MIL lab, which is part of the national infrastructure of innovation, pilot testing and experimental development of industrial production systems in a country like Norway, had a difficult time getting access

to the type of technology we tested because of tighter regulations and accessibility, then I find it less likely that a traditional silversmith would have access to such technology. Accessibility might be a contemporary problem. Still, Professor of African Politics Evaristo Benyera (2021), amongst others, has described how the fourth industrial revolution works as a recolonisation of the Global South. He elaborates on how the rapidly growing demand for technological development creates new ways of looting this part of the world for its resources, with humanitarian costs. Like the former colonial period, the Global South is again fuelling technological development, but it has no control over the distribution of or take part in the wealth (Benyera 2021). The world situation and the growing need to implement the concept of sustainability in decision-making processes make the fourth industrial revolution and its potential to electronically and digitally transform industry slightly different than the previous industrial revolutions since the SDG makes the paradigm of limitless growth, exploitation, and expansion problematic.

Even though we in wealthy Western societies may not see the fourth industrial revolution as a recolonisation of the South, rapid technological development involves the rapid consumption of resources (Pitron 2023). Renovation work, accentuated in the case described that technological expansion is not a quick unproblematic and easy fix.

Closure

The research case at the MIL lab serves as an example of how craft can play a fruitful role in research. As the project grew, it became clear that the hours of work that I first considered a mere distraction actually intra-acted with the different perspectives proposed by Haraway, Barad and Planke and created a conceptually and pragmatically red thread throughout the project. My perspective on the activity was conceptually renovated, as the numerous hours spent at the workbench caused the activity to grow in importance and ultimately become a significant part of the research.

Karen Barad's (2003, 2007) theory of agential realism and her attention to the void, the space between a phenomenon and the relationship between the material and the thinkable, has offered another way to view the relationship between technology and traditional craft that does not resort to binaries and dichotomies. The 'renovated' perspective on technology, craft, materiality and meaning accentuated the fact that less resource-demanding technologies and hands-on material skills are not only valuable as carriers of the cultural components linked to identity. The perspectives of agential realism gave me opportunity to consider surface work as an apparatus through which the exploration of mechatronic technology was diffracted. Still, this initial awareness of how mind and matter interact and have the potential to work in unity

and generate new insights and understanding only came about through being open to the possibility that situated knowledge has the potential to lead to unexpected outcomes that are not possible to foresee or discover purely through intellectual cognitive and visual work , with the crafts role as predetermined.

Although the research case findings are multifaceted and it is difficult to draw any specific conclusion from them, I have, through this work, nevertheless come to reflect critically more often on what technology I can do without, whether from a business standpoint or in relation to building new knowledge and understanding.

AUTHOR

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Stefanie Mallon

Materialities of 'Mushroom-Leather'

A Critical Appraisal of the Material Dimensions and Sustainability of Fungus-Based Alternatives to Leather for use in Fashion and Textiles

Abstract

The ever more apparent unsustainable and unethical effects of the garment industry have caused consumers to face the dilemma of reconciling their interest in consumption with acting responsibly. The use of new materials in production, for example garments made from fungi, offers one way for consumers to resolve this. Fungi are being imbued with almost mythical attributes as a beneficial organism with transformative powers in many narratives – including ones from the fashion industry. Products are being promoted as if they were already widely available. However, the available information is ambivalent and might raise some doubt as to the material's market readiness and/or its overall sustainable effect. For this paper, I will analyse the information economy, celebratory narratives and mushroom materials from experimental fungus-growing experiments. I will examine closely the range of materialities around the phenomenon of fungus 'leather'.

Keywords: bio-economy, mushroom-leather, mycelium, fungi, fashion, textiles, materiality, knowledge

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 81–110. https://doi.org/10.23991/ef.v51i1.141682

Introduction

Fashion provides exciting potential for many consumers, facilitating the exploration of aesthetics, materials and visuals and the investigation of socio-cultural positionings in the world. But there is another side of it that is exploitative, polluting and socially irresponsible. Furthermore, by its principle of making looks obsolete sooner or later after having once been *en vogue*, it can be described as a waste production machine (see, e.g. Nayak et al. 2021; Remy et al. 2016). At a time of growing awareness of the mess the fashion industry leaves in its wake, fashion enthusiasts are increasingly facing up to ethical questions and are keen to reconcile their consumption with the knowledge that the products they buy have been made in a responsible, sustainable manner and do not produce excess refuse (e.g. Gazzola et al. 2020).

Principally, fashion products are made from a broad range of materials classified as either 'synthetic' or 'natural' materials. Synthetic materials are mineral-oil-based materials, meaning they draw on a non-renewable resource and produce long-lasting waste when disposed of, due to their resistance to decay. 'Natural material' does not, in the first place, refer to a material's performance in terms of sustainability. It refers to a material that is based on organic substances and fibres as raw materials. They could even be compostable were they not routinely finished or mixed with mineral-oil-based materials or other non-bio-degradable matter. In scaled industries, they have, nonetheless, an exploitative effect both socially and environmentally and an unfavourable climate balance. Some natural materials are ethically questionable, if not downright cruel, like animal hide, which is made into leather. Leather – allowing for differences in quality – lends itself quite well for use in garments. It can easily be sewn and used in garment or accessory production; it is generally malleable while still being very durable. The issues causing concern have to do with a lack of animal welfare, CO2 output and the pollution caused by animal husbandry. Another point of concern is that leather is a processed artefact: conventional tanning is not only extremely polluting, but also leaves toxic residue in the material (Lofrano et al. 2013).

Given the numerous harmful impacts of conventional materials, one of the strategies for conscientious fashion consumers is to look to the invention of new materials (e.g. Oki 2021; Preuss 2017; van der Haak 2018; Morby 2016). They are not alone in hoping new solutions will emerge from laboratories and the (material) experiments done by scientists and engineers. Many feel a palpable sense of excitement that the fashion industry is on the cusp of addressing the above-mentioned issues, actively countering resource-draining and refuse-accumulation practices. In this article, I concentrate on the possible use of alternatives to conventional leather for fashion materials. One of the

raw materials that is currently exciting the imagination of many and receiving quite positive discursive treatment (e.g. Garcia-Pardo 2016; Schwartzberg 2019; BBC Ideas 2022) is that of fungi. As an alternative to leather, garments made from mushrooms are thought to be a humane, environmentally friendly and easily re-growable alternative for providing an abundant supply of material: it is widely known in public discourse as 'mushroom leather'.

The generic description 'mushroom leather' is technically imprecise. I am still going to make use of it at times in this article, though, because of its instant recognisability and because it is already deeply rooted in the popular imagination. But the term is mainly imprecise because the word leather refers quite specifically only to products made from animal skins and hides (e.g. Encyclopaedia Britannica 2023). In fact, the CEO of one of the best-known enterprises in this field, Matthew L. Scullin of MycoWorks, has attempted to curb expectations by stressing that his company's product is not a substitute for leather, but rather a new material quite in its own right (e.g. Scullin, interviewed by Menkes 2022). The second inaccuracy lies in the term 'mushroom': mushroom-'leather' is used to refer to (at least[1]) two very distinct types of fungi-derived products. Only one of them is actually made from mushrooms – which are the fruiting part of fungi. This product is called *amadou*. The other material is made from mycelium – which is a network of filaments, the root-like part of fungi. Mushrooms are not used in this mycelium-based material at all. It is the latter product that several enterprises are investing in currently. The companies concerned seek – all differences aside – to pile into the same niche that leather occupies in the industry for garments and accessories. The media has provided an abundance of information on its development, which suggests a broader interest in and readiness of the public for such fungus-based products and an expectation that they will replace animal leather. The producing companies generate support and funding, with the bioeconomy in general receiving increasing financial and structural support (International Advisory Council on Global Bioeconomy 2020, 158–163). The materials industry is dynamic and of great social relevance. New types of materials are continuously being developed for new purposes as soon as the technology is available. Due to advances in technology and genetic engineering, the possibility of transforming or growing mushrooms into a leather-like material generally appears quite plausible. For example, throughout the 2010s 'the future of fashion' was

1 Other fungus materials do exist, for example some made from Kombucha (yeast and bacteria) (e.g. Grushkin 2015; Oiljala 2014) and other liquid-growing cultures (e.g. Sangosanya 2022). But they are not considered here. The focus is on fungi growing in solid organic matter as a substrate to ensure comparability with the mushroom-leather products, which mostly dominate the discourse around this phenomenon.

often being discussed in laboratory settings (e.g. Backlight 2019; Dworsky 2014; Goormaghtigh 2017; Fries 2013; *The Economist* 2018).

However, from the beginning my practical and tacit knowledge of textiles, clothes and clothes-making has conflicted with what I was learning about and was being presented with in this context. With qualifications in textile science and costume design, I am familiar with the particular qualities that materials for use in garments (textiles as well as leather) must be imbued with, furnishing them with the ability to withstand the extreme stresses of wear, tear and care while at the same time satisfying the requirement that they are relatively pliable and soft. I was curious to find out about how the new fungus materials could meet such demands. When delving into the field in more detail, I was taken aback by the lack of tangibility of the phenomenon. Three enterprises have been the focus of countless media representations and the broader discourse about using mushroom-'leather' for garments: MycoWorks, Bolt Threads (which produces the mycelium-'leather' Mylo) and MycoTech. I had contacted the producers hoping to acquire samples of the material. But, despite my repeated requests to MycoWorks and Bolt Threads, I received no reply. Only towards the end of my research phase did I manage to buy a sample from MycoTech (discussed below).

So, to assess the phenomenon, I was reliant on the information presented on the companies' websites (MycoWorks[A], n.d.; Mylo[A], n.d.; MycoTech[A], n.d.). The information available in videos, in articles and on the websites had an almost ephemeral quality to it – never leading to any concrete results, instead only sending me into endless clicking loops and confusing echo chambers and continuously exposing me to the same few visual representations of the materials. All insights were tightly controlled, with the computer-generated videos often being artists' impressions, which seem to make liberal use of their artistic license, videos with suggestive cuts, blurred photographs from very specific angles and ever-recurring images of, e.g. a Hermès bag from 2021 (MycoWorks[C] n.d.; Hahn 2021; Luxiders n.d.; *Excellence Magazine* n.d.; Live Kindly n.d.).

Based on the premise that the garment sector is particularly demanding with respect to materials, the article shows how the websites make the case for mushroom-'leather' as a suitable fashion material and questions such a representation. I thus analyse them systematically, with specific emphasis placed on information about production (and its alignment with sustainable standards), the materiality of the products (to evaluate their performance potential in fashion items) as well as the range of products and their performance. I also consulted scholarly articles on the subject, including those that discuss mycelium-'leather', mainly from the material science angle, to sup-

plement the information made available about production and performance by the companies.

However, experience psychologist Friedrich Weltzien and communication researcher Martin Scholz (2016) write that it is not possible to understand materials purely from a theoretical standpoint. When implemented for use in designs, it is essential for the designers to familiarise themselves with the physical properties of a material (Weltzien & Scholz 2016, 11). To better understand the tangible material dimension of the mushroom-'leather' phenomenon, I also conducted my own empirical experiments, growing fungi in my own home, exploring their material qualities and measuring them against the textual pieces of information concerning their production, materiality and performance. This strategy constitutes a tentative exploration of the performances of fungi in a more tangible way. Based on the observations, I formulated questions regarding the potentials of fungi material for garments.[2]

To provide insights into the social importance of materials and their customisations, which steadily increases their range of uses and respective social lives, this article first briefly explores the history of progressive customisation of materials through implementation of chemical and technological treatment. The descriptions of the various stages of technological advancement and the dynamics produced by the introduction of synthetic materials in the garment industry are then used to analyse the various dimensions of materiality in this article.

Materials and their societal impact

Materials are an important building block of economic activity. To add value and render them usable for specific purposes, since pre-historic times even 'natural' materials have been subjected to – rigorous – processing to alter their properties (e.g. blending or heat/mechanical treatment). For example, animal skins have been tanned to stabilise the material and make it resistant to decay by changing its protein structures using either fat, plant-based, and mineral-based tanning since approximately 8.000 BCE (Barbe n.d.). But raw materials will retain some of their idiosyncratic attributes, which determine the qualities and appearance of any product made from them. In her 2015 article 'Materials – The Story of Use', the anthropologist Susanne Küchler (2015, 268–269) points to a flurry of increased public and economic interest in the use of materials in Europe in the late 19th century, when an influx

2 DIY mushroom growing has been extensively documented on the internet, and it would be interesting to compare the results. However, the main aim here is to examine the empirical evidence of mushrooms' materiality to better understand how the mycelium grows and how the material performs.

of new materials from around the globe provided the bases for new products and inspired new ways of building and producing. This interest was further fuelled by the discovery of a new way of mechanically manipulating the properties of one such material, natural caoutchouc. This example offered the first insight into the immense impact a material could have socially. It had found use in water-proofing clothing even in the 19th century – with a notable example being the British Mackintosh raincoat, produced since 1823. But it was chemical alteration, which permitted 'the properties of the product to be varied to suit circumstances' (Allen 1972, 35) and this delivered the material to increased use options and creative exploitation. The chemical alteration of materials had a pronounced social impact, because it freed designers and producers from certain constraints that natural materials impose in the production process. This led to a phenomenon that the art historian Petra Lange-Berndt refers to as the caoutchouc-shock. Engineers as well as artists felt the emerging power and potential of being in charge of the end product's form and effect (Lange-Berndt 2002).[3]

The next great social impact of materials was felt when plastics made from mineral oil became available in the middle of the 20th century. The advent of these synthetic materials changed the market and revolutionised the concept of production and design even more (Postrel 2020, 218). While plastics also still have some irreducible characteristics, it is possible to imbue them with a very broad range of properties and appearances and employ them for very diverse uses – subordinating materiality to ideas and purpose. Their advent liberated art and design even more from the constraints – even dominance – of natural materials and permitted hitherto unthinkable formings and shapings. Polyurethane is one early example of a synthetic material that was so soft and flexible that, from the 1930s onwards, it was used to produce sponges. It is also one of the raw materials from which synthetic leathers are made. In 2022, world production of polyurethane reached 25.78 million metric tons, while 'it is forecast that the global market volume of polyurethane will grow to 31.27 million tons in the year 2030' (Statista 2023). Durability is another of its qualities. This has become one of the principal problems concerning the production of synthetic materials that the world is faced with today: waste products that do not decompose (Blesin & Möhring 2016, 183–184).

In fashion, too, chemical fibres changed the market significantly. DuPont, the US manufacturer and financier of the development of Nylon envisaged its main use to be in women's stockings in the 1930s. As Postrel (2020, 221) notes: 'When the first four thousand pairs went on sale [in October 1939 in

3 Similar to the example of the transformation of travel by the subsequent invention of inflatable rubber tyres.

New York], they sold out immediately, and within two years nylon accounted for 30 percent of the market for women's hose.' Being cheap and mostly easy to care for and clean, chemical fibres became firmly established in fashion. However, they were not, writes the anthropologist Kaori O'Connor (2005), immediately met with inherent enthusiasm in the early 20th century. Chemical fibres were at best initially perceived to be a cheap alternative. So, this 'hot sell' was not achieved without a major effort by the producers and marketers in working to understand the market and imbue the raw materials and the commodities produced from them with positive meanings to create a cultural receptiveness or even a feeling of necessity for them. O'Connor remarks that 'the economics of new fibres, which carry extremely high development costs, are such that for a fibre to be successful it must go into mass production' (O'Connor 2005, 46). The need to scale is the reason why, writes O'Connor, this interdependence between 'sussing out' consumers' needs and wants, creating fibres with specific qualities and careful marketing has continued to be of central importance.

In the 21st century, the functionality of materials has been further diversified through engineering and technology. Research has led to the development of materials with new properties to address everyday challenges in a variety of fields, for instance in building practices, dangerous professions, medicine or sports. They are not necessarily brought to market but can exist only theoretically – with their production details and eventual qualities archived in databases (Küchler 2015, 274). In their use, design and idea precede the actual physical material, which is then only produced on demand. By providing materials in this conceptual form, with many materials only existing in these databases with their computed properties, this is in effect freeing materials from having to take physical form. They can remain virtual and this virtual form does not necessarily impede the political, economic and symbolic importance of their potential use. Rather, as a result 'the early twenty-first century is being defined by a new materials economy driven by a flood of engineered technological materials whose capacities offer far-reaching promises' (Küchler 2015, 271). The advanced materials market is expected to grow even more in the next few years. The materials may be marketed on websites, which Küchler calls 'honeytraps'. In this virtual space, materials can be made to perform completely without regard to any physical constraints or laws of likelihood (Weltzien & Scholz 2016, 9). But Küchler sees a strong dynamic behind new materials also being driven by global political interest: 'As a result, the early twenty-first century is being defined by a new materials economy driven by a flood of engineered technological materials whose capacities offer far-reaching promises' (2015, 271). She argues that this leads to immense over-pro-

duction and a new materials bubble: 'On-the-ground research shows that a staggering percentage of materials invented and manufactured at great cost rail within the first five months to establish a secure market, often for social rather than scientific reasons' (Küchler 2015, 271). While O'Connor – with a view to materials in the field of fashion and textiles – states that there is now a public awareness of the effect of man-made fibres (O'Connor 2005), Küchler warns – given the enormous impact that materials have – that their social performance needs to be studied more intensively, particularly for those cases where they are not taken up by users after production precisely because they do not perform favourably. This leads to them ending up as landfill; so, after having been produced at high energy costs, in addition they will pollute the environment as waste. This point is acutely pertinent in the case of fashion, where the effect of materiality is felt acutely by the wearers (Woodward 2005).

The emerging 'bio-economy' sends a fresh impulse surging through the materials industry, attracting political interest and investment in research and development (Fehr 2021). The core definition of the bio-economy's aim is the 'production and utilization of biological resources to generate high-value biobased products', taking another step towards innovation and invention, with an 'increasing proximity to converging technologies, such as biotechnology, nanotechnology, information technologies, and digitalization' (International Advisory Council on Bioeconomy 2020, 153). With the aim of addressing the problem of waste, toxic production and the use of non-renewable, mineral-oil-based resources, it draws on conventional bio-substances, even waste products, as raw materials. 'Innovation' features large in paving the way for the bio-economy (Braun 2021), and it lends credibility to the general endeavour with reference to emerging technologies, through which raw materials can be imbued with new attributes and characteristics. It promises new materials in addition to natural materials that can be altered to become more malleable for specific human use. But the alteration goes beyond mechanical or chemical manipulation of the raw material; next-gen materials are modified in their make-up through engineering or bio-manipulation. The term next-gen materials refers to materials with less negative of an environmental impact because they are based on abundant renewable resources and manage to mimic established natural materials. The result are familiar substances, which seemingly can be made to perform in unexpected but not impossible seeming ways. This saves resources and, if not polluted by chemical substances, the resulting products should be able to be recycled without problems after use. Bio-based or bio-degradable materials are certainly expected to be part of the answer to 'guilt-free' consumption (Blesin & Möhring 2016, 185).

Mushroom-'leather': *Amadou* and mycelium

In the following section, I take a closer look at the phenomenon of mushroom-'leather' against the backdrop of the evolution of such materials and their increasing social impact. Some *amadou* products were on display on the *MS Wissenschaft* in 2021, an exhibition ship funded by the German Federal Ministry for Education and Science, a travelling exhibition dedicated to the bio-economy. The exhibition touted *amadou* as one of the natural materials with potential to transform the economy as a vegan 'leather' (*MS Wissenschaft* 2021). *Amadou* is a product of an old craft of retrieving a spongy material from specific mushrooms. It is practiced, for example, in Romania using the mushroom *Fomes fomentatis*.[4] The mushrooms grow on dead and dying trees and are common in Europe, North America and Asia (Müller et al. 2007). A soft and supple material that looks and feels very much like suede can be produced from the sponge. Despite the science-based background of the ship, the necessary information provided to visitors on the potential – and limitations – of the material was scarce (MS Wissenschaft 2021). Exhibitions are a genre that for the most do not allow to delve deeply into subject matters. But I also understand the concentration on the positive aspects of *amadou* as part of a perceptible general commitment to supporting an affirmative discourse around the potential of mushroom materials as a leather substitute, even on the part of the 'science boat', without probing or questioning it too much.

It can be said that *amadou*, while being 're-discovered' now in the search for alternatives to animal leather, is not new but is instead only a matter of looking back on a long-standing tradition. When placing it within the spectrum of materials laid out above, *amadou* is in fact a 'natural' material that has been manipulated to make it usable in specific ways by humans.[5] *Amadou*, however, has idiosyncratic qualities that incorruptibly determine the form, function and appearance of the product. So, even though *amadou* looks similar to suede and seems to hold great promise as a leather substitute when viewed superficially, there are two main obstacles. The *first* is that it does not perform in the same way and is not durable in the same way as leather. It is sensitive to exposure to water, even moisture and friction. This means that resulting products cannot be washed and that out-door products must be protected from the effects of weather with waterproofing finishes (ZVNDER). Due to its lack of durability, *amadou* is used mainly in smaller products or in

4 This type of material is also found in *Phellinus ellipsoideus*, which grows in forests in subtropical regions.

5 The harvested materials must be stored in plastic bags for at least three weeks to keep them moist and soft (Schaub 2009, 30). They are then 'created by finely slicing and boiling the fungal fruiting bodies in an alkaline bath before manual stretching to form sheets' (Jones et al. 2021, 12).

products that are assembled from smaller pieces and need to be reinforced with other, sturdier materials. This limitation almost seems a minor drawback compared to the second issue that takes *Fomes fomentatis* out of the race as a competitor for leather substitution: the mushroom needs quite particular conditions to thrive in and cannot be domesticated. It has its own dissemination and growing rate – and production is not scalable. As engineers and chemists Jones et al. (2021, 12) observe: 'The limited supply of these fruiting bodies in nature and the time-consuming manufacturing process limits scalability and industrial viability.' Anna Lowenhaupt Tsing (2015, 38) calls this effect of resistance 'anti-plantation' – with reference to systematic colonialist agriculture that was both demeaning and exploitative of all the entities subjected in the process. This fungus is harvested mainly in the historical beech forests in the northern mountains of Bukowina, in Romania, during the autumn season. The best *Fomes fomentatis* grow in forests at heights of 800 m, where harvesting takes several days in the season. They provide quality gainful occupation for mushroom hunters, who self-determinedly follow traditional practices that continue to go under the radar of any possible supervision or disciplining (Schaub 2009, 40). They have thus far resisted exploitative practices in the wake of greater utilisation of the fungus. But it is lamentable that the natural material does not lend itself to becoming part of the future of the fashion industry and does not provide a solution for more responsible consumption.[6] Its lack of scalability leaves it in the domain and hands of craftspeople resisting the gravity of the industry's maelstrom.

Mycelium-'leather'

The real, tangible existence and suede-like appearance of *amadou* material and its prominent display in settings like the bio-economy exhibition feeds into the concept of mushroom-'leather' and its performance. It is used to blend into the concept of the potential of another contender in the field, mycelium-'leather',[7] which is a very different product. It is marketed as a technology-based manipulation of the familiar make-up of a natural raw material into a next-gen material to ready it for a completely new field of use and make it

6 It should also be noted that all raw materials that are grown on a larger scale (which is not possible with tinder fungus) might require environmentally harmful monocultures.

7 For example, in a report by DW News on the production of mycelium-'leather', one of the respondents, a scientist from the Fraunhofer Institute (see below), produced a piece of *amadou* and commented on its qualities. The report edits this segment into the clip just after having dealt with the same person explaining the production process of mycelium-'leather' without properly differentiating between the two entities (DW News 2020). As I will explain in more detail below, this part of the report was cut from the video clip in the current version.

perform in new ways. The raw material in this case consists of the 'root'-like part of the fungus, which is called mycelium. It is a birous material (made of chitinous polymers), which grows in the soil and/or organic material. The mycelium used to produce mushroom-'leather' grows mostly on woodchips as a substrate. When it grows profusely, is not interlaced with substrate or other matter and before it is dried, mycelium is a fluffy mat of interwoven strands and has the appearance of candy floss. What makes it particularly interesting for environmental reasons is that it is 'a biological organism to do all of your manufacturing for you, so there is no real energy requirement' (Elbein 2020). It would be very quick to grow and could be composted (if it remains purely organic). Production involves scant CO2 release (hardly any heat and no light are needed); in fact, fungi store more CO2 than the production would set off.[8] Some bioengineering is implemented to control the mycelium's growing process (MycoWorks[D] nd.). Jones et al. (2021, 14) argue: 'In addition to being more environmentally sustainable to produce than leather and its synthetic alternatives, as they do not rely on livestock farming or the use of fossil resources, pure fungi-biomass-based "leather" substitutes are also biodegradable at the end of their service life and cheap to manufacture.' Another interdisciplinary article states that mycelium 'has become a highlight in biomaterial engineering, owing to its zero pollution and renewability during the formation and treatment processes' (Raman et al. 2022). So, knowledge of this product from the perspective of the natural and material sciences will help researchers further evaluate its production as part of an environmentally sound process. This could make the material an innovative bio-economy contender: cheap, bountiful, cruelty free and made to perform at will.

Producers are hoping to replace a variety of alternatives to leather already on the market made from 'synthetic' materials, like polyvinyl chloride (PVC) and polyurethane (PU). Like other synthetic materials, they can be cheap to produce; they are durable and do not have to be tanned, like conventional leather, and they have the advantage of not being produced using processes that are necessarily cruel to animals. For production, compared with leather they seem to perform quite well by having a better climate balance with respect to CO2 emissions and water use (Jones, Gandia, John, and Bismarck 2021, 10).[9] However, they have a number of drawbacks. They generally do not perform as well physiologically with a human body, they might not be as durable, they

8 However, sterilising the substrates – which can be made up of waste products – through pasteurisation and suitable surroundings is necessary, and moderate heat might speed up the growing process depending on the fungus.

9 Some types of leather made from animal hides can be by-products of the meat industry. While the CO2 content is still high, in this case they do not release additional gas into the atmosphere.

might use up finite resources, they can be toxic during production and they leave toxic waste after falling into disuse or else can leak micro-plastics from the moment of their production (e.g. Oluwaseun Adetunji 2021; Commission of the European Communities 2000). Some other leather substitutes are partially made from biological waste products, like Piñatex, which is made from the fibres of pineapple leaves and use polylactic acid and 'water-based' polyurethane as a resin (Piñatex n.d.). This process serves to make them hydrophobic, binds the particles or fibres together, and gives them a 'leather-like' appearance and feel. So, they reduce waste but still need some synthetic additives. This makes them a mixture of natural and synthetic materials.

Representation of the materiality of mycelium-'leather'

Mycelium-'leather', by contrast, is generally marketed based solely on its biomass qualities. Marketers claim it has the potential to become a cruelty free, sustainable, natural and ethical luxurious substitute. The projections are generating economic interest. The think-tank Material Innovation Initiative states that, in the last ten years, $3 billion has been invested the field as a result (Material Innovation Initiative 2023). MycoWorks has generated $125 million in financing in 2021 from Prime Movers Lab, SK Networks, Mirabaud Lifestyle Impact & Innovation Fund, DCVC Bio, Novo Holdings and several other strategic customers and investors (Waltz 2022), followed by an estimated $63 million in October of 2022 (Waltz 2022, 15). In an opinion piece, Scullin (2023) writes that such strong financial interest has been, 'driving excitement around next-generation materials like mushroom leather [and others]'.

In the following section, I trace the materiality of mycelium-based mushroom-'leather' as it is described and marketed by the producers MycoWorks, Bolt Threads and MycoTech. The information, which shapes the material essence of mushroom 'leather' in its various forms, presents itself like pieces of a puzzle, or pieces of data. MycoWorks, which is the most prolific of the three firms, was founded by artists Philip Ross and Sophia Wang in 2013 (Hall 2021). One article about the company explains its mission as follows: 'Based on their strong financial structure and high-quality personnel, these companies collaborate with leading luxury companies, including Hermès and Mercedes-Benz, to produce basic raw leather, personal luxury items, and car interior materials' (Raman et al. 2022). But product descriptions remain opaque. They are well designed and appealing but use vague marketing language. The mysteriousness can – in part – be explained by the firm protecting production secrets in a niche market that is both promising and expected to become extremely profitable for ethical and responsible fashion. However, even other articles refer to and reproduce information given by the producers them-

selves to rate the products. For example, the biotech journalist Emily Waltz describes the production process as follows:

> MycoWorks […] grows the fungus from the species G. lucidum in trays of sawdust the size of half of a cow hide. Researchers coax the fungus to grow and branch into threadlike filamentous structures called hyphae (collectively termed mycelium) using proprietary tricks that involve controlling temperature, humidity, carbon dioxide levels and other aspects of the fungus's environment. The fungus colonizes the trays, resulting in a material that, through an undisclosed proprietary procedure, looks and feels like leather, according to the company. (Waltz 2022)

The mats of interwoven mycelium are then harvested and treated – in a tanning process – to take on qualities due to which the product is likened to leather. In her overview of the new uses of biomaterials, Jane Wood refers to MycoWorks in the following uncritical manner, her sole reference being the company's own website:

> The company uses the growing process of mycelium to bind with organic matter, thus creating a 'solid' textile, which is more akin to leather in appearance, rather than a traditional knit or woven fabric. The resulting material is flexible, durable, can be dyed easily and with natural dyestuffs, and has a degree of water repellency. (Wood 2019, 5)

Jones et al. (2021) actually explain in detail how the fungal sheets are grown:

> [S]olid-state fermentation typically utilizes a bed of forestry by-products, such as sawdust, high concentrations of carbon dioxide and controlled humidity and temperature to force the aerial hyphae to grow outwards in search of oxygen, avoiding stipe, cap and spore production. The continuous mat formed on top of the particle bed is then dehydrated to render the fungus inert, chemically treated to improve material properties, compressed to a desired thickness and imprinted with a selected pattern. (Jones et al. 2021, 11)

The authors go on to explain the chemical and technical processes that MycoWorks implements to make the material more leather-like. For their performance analysis, Jones et al. (2021, 13–14) also base their analysis on information provided by the company. Articles on the sustainability value of such products refer only to the companies' claims about the production process, taking them at face value, thereby supplying knowledge in an echo chamber. Thus, the materiality of mushroom-'leather' is developing momentum purely

in a discursive format. The material may have physical effects 'in the empirical world', but it exists to the reader and to some of the observers only as a representation without being grounded in concrete experience.

Mushroom-growing experiments for empirical insights on the materiality of fungi

All fungi are basically made of the same material building blocks: a chitin-glucan complex, a polysaccharide. This type of structure is unique to fungi and sets them apart from other organisms (plants and animals).[10] The specific compositional relations of the chitin and glucan in the complex can vary and, at times, instead of chitin the cell walls can contain chitosan, which has similar properties (Freitas et al. 2015). As Abo Elsoud and El Kady (2019, 6) note: 'Generally, the fungal cell walls are composed of chitin, chitosan, neutral polysaccharides, and glycoproteins in addition to minor amounts of polyuronides, galactosamine polymers, lipids, and melanin.' (For more discussion, see also Freitas et al., 2015, 2.) Chitin is a 'rigid polymer that is synthesized at the cell wall of the mycelium in order to protect its filaments by internal osmotic pressure, external humidity and other chemical and physical challenges' (Haneef et al. 2017, 8). It is the building block for all the parts of the fungus, including mycelium and mushrooms. Due to the unique and unifying make-up of the fungi cell walls, my basic assumption is that the materiality of the fungi that I am using and that of the fungi used for growing mycelium leather are comparable at a basic level, even though they do have different tensile strengths (Jones et al. 2021, 13).

All of the fungi utilised for mycelium-'leather' are filamentous fungi.[11] Mycoworks uses the Reishi (*Ganoderma lucidum)* for its *Reishi* product (Waltz & Nature Biotechnology 2022). Bolt Threads does not specify, which exact fungi it uses to produce the product Mylo. However, an oyster mushroom (*Pleurotus ostreatus*) is shown in the heading picture of a website referring to them (Objcts.io n.d.), and oyster mushrooms are a common fungus species used for growing mycelium (Varkki 2024). In my experiments, I also grew commercially available, edible mushrooms: Enoki (*Flammulina filiformis*), Pioppino (*Cyclocybe aegerita*), Lion's mane mushroom (*Hericium erinaceus*) and Button mushrooms (*Agaricus bisporus*). The first three were acquired as spores in a block of wood chips covered in transparent plastic on 15 January 2023. They

10 But some plants do contain glucan, and some invertebrates have chitin in their exoskeleton.

11 Fungi are either filamentous fungi or yeasts. Yeasts grow by budding. Mycelium consists of fungal filaments (hyphae) that have grown into a 'complex network' (Powers-Fletcher et al. 2016).

naturally grow on dead[12] wood in forests. To grow them for this study, I followed the provider's instructions. Wood chips serve as substrate (the habitat) for the fungi when they have developed from spores and provide the organic matter for them to feed on. The plastic covers regulate the humidity of the woodchip block. They needed to be slit carefully to allow the mushrooms to grow but not dry out. Extra humidity had to be provided regularly by spraying the ensembles. The necessary temperatures varied from 7–18 degrees Celsius (Enoki) to 20–25 degrees Celsius (Pioppino) and 10–20 degrees Celsius (Lion's mane). By the end of January, all three had grown mycelium inside of the substrate, and mushrooms sprouted from all sides of the block. It was possible to harvest the mushrooms. However, the remnants of the stems in the block developed mould quite quickly in the warm and humid conditions. So, it served as a breeding ground for other fungi (and possibly other organisms). By this time, the substrate had been diminished due to the decomposing action of the mycelium (it has served the fungi as food). The mycelium was visible as white webs interwoven with it, but never outside of it, or on the outside of the plastic cover.

The button mushrooms required a slightly different set up. The woodchip substrate infused with the fungus spores was covered by a 5 cm thick layer of moist soil in a transparent plastic bag placed inside a cardboard box. The temperature during the time when the spores were developing into mycelium had to be 21 degrees Celsius. Humidity had to be ensured by covering the ensemble with plastic covers, and the box was closed to exclude all light. I added a cotton t-shirt to one sample, which I placed on top of the soil, immersed partially, to see how the fungus would interact with the textile material. I grew another sample without using the t-shirt as a control sample. Once mycelium was visible on the surface of the soil (after 15 days), the temperatures had to be lowered to 15–18 degrees Celsius. Mushrooms started growing after another 20 days. I grew two boxes of button mushrooms. The t-shirt that had been placed in the box had decomposed wherever it had been immersed in the soil. Pigments in the colour of the t-shirt were surfacing in other parts of the box, on top of the soil. The mushrooms kept growing and ultimately had to be harvested. By the end of March (after two and a half month), green mould had started showing on the surface the soil between the button mushrooms. Samples of mycelium and mushrooms from the four types of fungi were dried to examine the changes in the material's properties. The samples hardened to a woodiness and changed from a malleable state to exhibiting more of a crispy brittleness. They could not be bent or changed from the shape they had dried

12 Lion's mane mushroom (*Hericium erinaceus*) and oyster mushroom (*Pleurotus ostreatus*) can also grow on living trees.

into and would snap if manipulated. One larger mushroom that had not been laid out to dry carefully or turned over to let the air circulate around it (rather, its cap was in full contact with the surface) developed mould.

Before I start relating my observations to the data provided by the websites, videos and articles, I need to highlight the obvious limitations of such an experiment. The growing settings and the available technology are unequal to those of the companies producing mycelium-'leather'. Due to the opaqueness of the companies' processes, no comparability can be assumed. However, the observations do serve as a foundation for formulating questions regarding the performance or basic suitability of fungi raw materials for garments and also their representation on the websites and in the media in digital space.

Observations and resulting questions

First observation

During the course of the mushroom-growing experiments, I was able to observe that the mycelium decomposed not only the substrate but also the cotton material of the cotton t-shirt that I had placed in the box and partially submerged in the soil. It had completely metabolised those parts of it that had been immersed in the soil of the growing box. Only small bits of the dye pigment appeared on the surface of the soil throughout the box, probably discharged due to its un-digestibility. But the mycelium had treated the cotton (which, like the wood chips at the bottom of the box it was meant to feed on, is made of cellulose) as a substrate.

MycoWorks states on its website that it produces three different mycelium-based 'leather' products: pure mycelium, mycelium grown into a textile made of cotton and mycelium grown into a textile made of polyester (MycoWorks[E] n.d.; see also, e.g. Williams 2022). In early 2024, the vice president in charge of sales, Fred Martel, was quoted as saying that the company was considering the option of making the mycelium grow into a woven cotton material. He has stated that one of their products, 'Reishi', can be grown into a sheet of cotton to make a whole new material that rivals animal leather (Teisseire 2024). At the time of first reading this in 2022, the idea had made sense to me, because the textile material could potentially enhance the flexibility and durability of the product.[13] But after observing the digesting process firsthand, it now seems questionable that this very simple metabolising process, at the very centre of mycelium's growth action, can be prevented from occurring,

13 Many synthetic 'leathers' are reinforced with textile backings to increase their durability.

even through the use of technology or bio-engineering.[14] This raises the question: If mycelium treats cellulose textile materials as a substrate and cotton textile materials also as cellulose materials, how then can cotton be integrated with the mycelium during the growth process to 'strengthen' the product?

Second observation

In the experiment, the matter in the *Agaricus bisporus* boxes was made up of substrate, soil and the growing fungus (mycelium and mushrooms). Since they had to be kept moist and at room temperature, eventually the contents of the boxes (both with and without the t-shirt) developed mould, as was to be expected. As natural materials, fungi are susceptible to infection via pathogens. MycoWorks CEO Scullin stresses that the company goes to great lengths to ensure that the facilities and the growing process are kept free of contamination. The fashion blogger Suzy Menkes asked the CEO Matthew L. Scullin in 2022 why, during a visit to MycoWorks, she was not allowed to view the production site, which was carefully guarded. Scullin's response was that the site must be kept sterile (Menkes 2022), so that during production, when the mycelium is still fresh, the controlled laboratory environment will prevent pathogens from taking hold.

I also observed that mould started growing on mushrooms that had not been properly dried. In their dried form, the mycelium sheets are not inducive to attracting microorganisms as hosts. But one of the studies evaluating the performance of mycelium-'leather' identified a problem with mycelium-'leather' soaking up and retaining moisture (Raman et al. 2022). This would make the material vulnerable to decay even at later stages of use. Jones et al. (2021) noted that the natural decomposing effect of mycelium is counteracted by a chemical treatment of the material after it has been grown into a sheet: 'Initially, the precursor tissue may be treated with lipids, moisturizing or hydrating agents, such as glycerol or sorbitol, to increase its water content, and sectioned. The tissue is then immersed in, vacuum infused or injected with sodium hydroxide, acetic acid or alcohol, such as isopropanol, ethanol or methanol, for periods potentially ranging from five seconds to six months.' (Jones et al. 2021, 11–12) The solution the material is treated with removes tissue from the mycelium and denatures the remaining proteins to protect it from susceptibility (Kaplan-Bie 2018). MycoWorks and Bolt Threads make mention of a tanning process for mycelium-'leather'. MycoWorks stresses that it is a chrome-free tanning process (MycoWorks[B] n.d.). Bolt Threads states that it is using a 'gold-rated tannery' by the Leather Working Group (LWG) (Mylo[D]

14 I have asked for more information about this process in several comments to posts by MycoWorks on LinkedIn and Instagram, but I have not received responses.

n.d.).[15] This means that this new material does not provide a tan-free alternative to leather. Neither is it the compostable product that Jones et al. tout it as (see above).

The observation points to still another potential problem with this natural material. If fungi substances are prone to retaining moisture, then the issue is particularly pertinent for the everyday wearing of clothes made from this material. They will invariably be exposed to the body's perspiration and/or humidity from weather conditions.[16] The addition of a material like polyurethane – as will be discussed in more detail below – could make the product hydrophobic and prevent it from absorbing moisture. However, this raises the question whether mycelium-'leather' can count unreservedly as a sustainable material if it has to be treated, de-natured and even have synthetic materials added to it.

Third observation

The mycelium in my experiment became brittle once it had dried – it did not retain its flexibility or durability. As mentioned above, comparability is limited, because MycoWorks and Bolt Threads did not use the same fungi as I have.[17] Jones et al. (2021) have suggested that the mycelium used in the materials being marketed are engineered or genetically altered without elaborating on how exactly that could be done. Researchers also state that, because mycelium is an organic living entity dependent on nutrients, moisture and the right environmental conditions, the composite they grow in is significant for its resulting performance. But, as stated above, all fungi have in common the fact that they contain chitin. Chitin has been investigated for use in items demanding high textile quality. For example, health and medical researcher Pierre Layrolle has examined chitin as a possible raw material for sutures. But his findings are that the potential is limited:

Although the apparent potential of chitin and chitosan derivatives in the preparation of sutures have long been recognized, there is still no commercial production of chitin-based absorbable suture materials because of insufficient

15 The tannery's website does not mention Mylo or any other fungus-'leather' product (Leather Working Group n.d.). This is surprising in the sense that the tanning procedure for mycelium would be quite different to that used to tan animal hide and would have warranted mention in the company's portfolio.

16 Mylo's life cycle assessment simply addresses the ecological impact but not the use performance of the product (MyloC).

17 The websites for the most part do not specify what fungi are used for this type of material. Raman et al. (2022), though, provide details on the fungi that they used to evaluate the performance of mushroom-'leather'.

elasticity of chitin threads and certain limitations of their processability into the fibre form. (Layrolle 2011, 230)

This same lack of elasticity has been highlighted in articles studying the qualities of mycelium-'leather', too. While Raman et al. (2022) are generally positive about the *potential* of mycelium-'leather', they are more hesitant about touting the performance of the product. The authors point to a lack of flexibility and a lack of resistance to friction, which will have to be addressed (Raman et al. 2022). In another article, Jones et al. (2021, 11–12) note that manufacturers could compensate for this lack of elasticity by lubricating the material to ensure a leather-like performance through physical and chemical processing, thus counteracting its potential brittleness. However, others have stressed that 'plasticizers should be natural and biodegradable with low toxicity and good compatibility with mycelial biomaterials' (Raman et al. 2022).

As already noted above, I had contacted MycoWorks and Bolt Threads several times through their websites (using contact interfaces mainly directed at buyers), but they did not respond to any of my many requests for information, nor was I able to acquire any samples to enable me to evaluate the attributes, quality or performance of the material.[18] However, MycoTech has recently sent me two samples.[19] They turned out to be very dense, rigid sheets of material, which do not evoke any associations of leather – or suitability for use in garments. Both are mounted on a very thin woven textile material. (A closer description of the samples follows below.) Even though MycoTech's samples do not allow any conclusions about the other products discussed in this article, this example underscores the general issue of a lack of flexibility of dried mycelium mentioned above. This raises the question: If Mycelium lacks flexibility and becomes brittle when dried, and if it requires significant processing to alter its make-up, then what qualifies it as a raw material in garment production in the first place?

Fourth observation

The mycelium in my experiments lived and grew inside the wood-chip blocks and never began to grow on sheets outside of the plastic sheets. The mycelium became visible as a white web on the surface of the substrate, but it was

18 Some products seem to be on sale through the website, but I cannot find any way to purchase them myself through the websites or with the google shopping filter. The websites repeatedly feature carefully chosen and controlled images, artists impressions and short videos, but there is a conspicuous lack of samples of the material to really understand or know what it can do

19 One of the samples was black and the other ochre-coloured with speckles – a 'mushroom' colour. Mycelium-'leathers' on display are often tinted in the latter, as if the colour occurred naturally, or black. Mycelium is naturally white, however.

deeply intertwined with the material. It built its web deep inside the sawdust within the blocks. The mycelium growing out of the substrate block did not at any point form tufts of fluff on top of the block or grow into a sheet on the outside of the plastic wrap.

This conflicts with a video clip from the German news outlet DW News on the Indonesian company MycoTech, which (at the time of filming) operates from a small warehouse (DW News, 2020). The clip shows shelves with blocks of substrate wrapped in transparent plastic, with mushrooms growing out of them, each with a bit of white fluff – with the appearance of wispy textile fibres – on top (DW, min. 0:12–0:18). The narrator, in describing the production process at MycoWorks, says 'on the outside of these sawdust blocks they produce tightly woven mycelium, which can be harvested within a few days' (DW, min 1:55–2:01). The visuals show the sawdust blocks, and the camera then turns to workers manipulating and scraping 30 x 30 cm squares of floppy, moist, beige-coloured material and hanging them up to dry. This imagery suggests that the mushroom-'leather' had first been peeled outside of the blocks and that it grows readily into the featured sheets, which would make it a natural material not requiring any manipulation and added value at all.

When I first accessed the DW News video on MycoTech in June 2023, it featured a young scientist from the German Fraunhofer Institute relaying that he was involved in the process of producing fungus 'leather' and offering his view on the issue. He spoke quite positively about the process and served as the scientific source of credibility in the report (wearing a white lab coat). The sample that he had shown to the camera in the clip had seemed quite rigid. This indication of the material's performance roused my interest. In June 2023, I contacted him – and he actually responded, which surprised me after the consistent ghosting I had experienced when attempting to contact the companies. However, when I asked if I could study a sample of his fungus material, he said it was not possible. After his affirmative statements and the positive outlook provided in the report, the response surprised me even more. Again, I was not able to acquire any samples. The scientist explained to me in more detail his viewpoint, stating that the science and technology had not progressed far enough yet to produce mushroom-'leather' at all. Rather, he wrote in the email that the product was still in the developmental stage. He had received many requests regarding this issue and explained to me that it was not worthwhile to send samples because it would require a great deal of paperwork and prior agreements.[20] His appearance in the video clip has since been removed from the report (without any mention of the change in the pro-

20 The email exchange has been archived by the author.

duction details) (DW News 2020). This underlines the ephemeral quality of online information and the ease with which it can be manipulated. This raises questions about the relationship between the mediatised representations of the materials and the analogue materials that they refer to. What limits the performance potential of a material that exists in digital space?

The materialities of mycelium-'leather'

For a long time, the producers of these types of alternative mushroom-'leathers' have claimed that they are free of mineral-oil-based materials. Bolt Threads has, however, since had to admit that they are indeed adding 'water-based polyurethane' to its product Mylo. This means that their mycelium-'leather' does not qualify as a next-gen material – a natural material with enhanced qualities through engineering. It is, instead, a natural material mixed with 'synthetic' materials. This addition is known to make natural raw materials hydrophobic and add flexibility and strength.[21] Following this shift in marketing, the website now states that the company adds 'water-based polyurethane' to its product to imbue it with additional required qualities. Some voices claim that using chemical fibres or raw materials would still be more favourable for the environment than using animal hide (e.g. Vacano et al. 2021). After having entered into partnerships with Stella McCartney, Adidas, Lululemon and others, the company has, however, currently halted production due to 'inflation and waning funding opportunities' (Chan & Webb 2023).[22]

I have carried out a burning behaviour test on the sample I had received from MycoTech being counseled by the textile sustainability expert and chemist Norbert Henzel in October 2023: the material burned vigorously, emitting small sparks and producing thick grey smoke with a bitter, pungent odour. This behaviour could point to the fact that at least part of the material is of synthetic origin. A small remainder of light ash at the tip of the charred part testifies to its organic components, suggesting that the sample is a mixture of natural and synthetic materials. By comparison, I was not able to light my own dried mycelium sample, nor could it burn by on its own. When immediately exposed to a flame, it produced a slightly bitter smell, some light smoke and a whisp of light grey ash, which indicates the organic make-up of the substance. Henzel makes sure to point out that a definitive analysis determining the composition of this material would need to be carried out in a laboratory test.

21 One customer stated that they had only found out about this synthetic component from the factory making the products made with Mylo's leather substitute (Tonti 2023).

22 Its website, however, continues to promote the product without making any reference to the difficulties faced in producing it (MyloA), which seems to suggest that it is still poised to play a part in the market.

Intractable natural material

So far, most of the products that the companies advertise on their websites are accessories, like purses and bags or jewellery. These are often made up of smaller pieces of material and a possible lack of flexibility is not as striking. However, Stella McCartney designed a whole outfit made with Bolt Threads's mycelium-'leather' Mylo in 2021. It is a design implementing smaller pieces of the product; they are jointed by a textile jersey material. This design has been widely used to support the narrative of mushroom-'leather' having entered the market successfully. However, it has never gone into production. The label's statement on its website reads: 'We used Mylo™ to create two garments – a black bustier top and utilitarian trousers – that are not for sale but do embody the potential of this next-generation material and pave the way for future commercial offerings' (Stella McCartney[A]). The use of Bolt Threads's mycelium-'leather' for small handbags in 2022 proved more fruitful. They are readily available for sale (Stella McCartney[B]). MycoTech's mycelium-'leather' has been used in a collection by the label Apakabar in 2022 (MycoTech[B]). Again, only smaller pieces of the mycelium product have found use. In this collection they were sewn onto textile pieces (woven or jersey). The label's website shows a single piece, a blouson jacket, which seems to be made mainly from mycelium material. It consists of patch-worked smaller pieces that are – as becomes evident on closer inspection – reinforced by a textile material on their left side (Apakabar Atelier). Beyond this, MycoTech is mainly offering small accessories (which are often thick and inflexible), but it has diversified and now lists home furnishings in its portfolio as well. MycoWorks has recently cooperated with General Motors to provide material for the interior of a luxury Cadillac called SOLLEI (2024). The headlines and various pictures posted to mark this project do not do much to prevent the impression that the collaboration encompasses the car's whole lush interior upholstery. One of the posts starts off evocatively: 'Imagine one day being able to grow material to the exact size of a steering wheel or dashboard, reducing offcuts and speeding up supply chains. Fine Mycelium™ materials are a new category of their own.' (MycoWorks[F] 2024). The attentive reader learns that mushroom-'leather' is used for the car's charging mat cover and the door pocket linings only. Of course, these are areas, in which the material does not have to endure excessive stress. The prevalent use of small pieces in all these examples, in places where they are not subjected to wear and tear or which are joined by textile jersey and/or reinforced by textile materials on their left side, points very strongly to an, as of yet, unsurmountable lack of flexibility and stability of the product itself.

However, as pointed out above, Scullin has already promoted MycoWorks' product as a material in its own right while dampening down expectations of it becoming a full-scale replacement for leather (Menkes, 13:30–13:57 min.). It has recently appeared in an interesting collection (to which I also only have mediatised access): Deadwood Studios has created a line of products from Fine Mycelium (Deadwood 2023).[23] The designer team is making the stiffness of the material readily apparent in the pictures – which is probably the signature component of the in-submissible part of the mycelium – as the dominant look. A video presentation of the collection provides viewers with only two short glimpses of a model wearing one of the designs (Deadwood Studios, 2023, min. 2:34–2:41 & 4:37–4:48). It is an ochre-coloured belted long-jacket, which is quite striking in the otherwise more dust-grey-tinted collection, with its somewhat apocalyptic theme. This sensitivity to the idiosyncrasy of the material might indeed be the way forward to understanding what it can do in fashion. It is a tribute to the material as an inspiration to the designer (Spellmeyer 2016), and an acknowledgement of it being something other than a leather substitute and that 'fashion companies have to understand how to offer products and experiences that customers will perceive as unique' (Rath & Bay 2015). So, in this scenario, and despite the generated expectations and the economic interest in the material, mycelium-'leather' does not present itself as a next-gen material that can be bent to human will, ingenuity and purpose through the implementation of knowledge and technology. Rather than possibly setting off a caoutchouc-chock-type aftermath of increased productivity and societal advancement, mushroom-'leather' has producers and designers bent to its own idiosyncratic qualities. To fully develop into a fashion material, however, it will not only have to address material and physiological challenges. It will also have to be able to be adapted to respond to fashion's demand to aesthetic innovation fluidly.

Conclusion

The phenomenon of mushroom-'leather' presents itself in a broad range of materialities. *Amadou* is made from a natural material that is distinctive and

23 Interestingly, MycoWorks' website features a link to Deadwoods SS24 Runway show. MycoWorks is not mentioned by name in the accompanying text at all. A link from the MycoWorks website to the new collection of Deadwood products leads to the show, in which neither MycoWorks nor its products are mentioned. Rather, the blurb mentions cactus 'leather': 'The core idea was simple: Garments and accessories made from materials that otherwise would have gone to waste. Pioneering the use of upcycled leather and vegan cactus "leather", continuously experimenting with new material compositions, and always encouraging carefully considered clothing – Deadwood is preparing for an unexpected tomorrow' (Deadwood Studios 2023).

intractable. It is not scalable, but instead largely re-enforces specific practices evolving around it, and it can only be used in idiosyncratic products. Some of the properties of fungi will surely lend themselves to technological and engineered alterations and become infused with alternative attributes. If it were possible to completely overhaul the conventional attributes and bolster the required ones sufficiently, then such a move could be the starting point for upcycling waste products, harnessing abundant non-toxic vegetable resources and creating items that can be composted at the end of their life cycle, but my observations of the physical material suggest that the range of possibilities are not limitless in this respect. As next generation materials, manufacturers have praised new bio-materials like fungus-'leather' for bringing new options to the table, which can address urgent sustainability and responsibility issues in the fashion system. Material and natural science studies seem to support the feasibility to a certain extent. Its actual material impact is not yet easy to predict, though, and none of the studies go so far as to vouch for their usefulness in fashion products. Mycelium-'leather' has not been fully realised from a physical standpoint, but it has been produced in part in a mediated way – with the potential to materialise completely in the future. It has – this is becoming evident – gathered great momentum as a material, though it currently exists mainly in digital form without having been subjected to the forces of friction. This example shows that a material can be very powerful and socially effective as an idea, but as an immanent physical material it still might not perform up to the imagined standard and thereby loses some of its compulsive force.

The fashion sector places extreme demands on its materials, not only regarding their functionality (being able to withstand the wear and tear of strain and also care practices) but also their aesthetic effects and – increasingly of late – their sustainability and environmental responsibility. Fashion can thus accentuate any shortcomings of the materials in this respect (when they might be very functional in other fields of implementation). The successful use of mushroom-'leather' in fashion has proven challenging because the product – while of 'natural origin' – has not been devised, or so I conclude, by building on its natural strengths (even though marketers give such an impression by stressing that the mycelium can grow into entangled networks and suggesting that these networks serve as the durable basis of the mushroom-'leather'). Instead, the mycelium must be coaxed, possibly genetically modified or chemically altered, to even broadly be able to serve as a raw material. So, despite all the technological progress and modifications made to fungi, which numerous articles promote, it does not seem to be easy to make fungi perform at will in the realm of fashion. Another issue is that after having been subjected to the

various manipulating processes, it is questionable whether mycelium-'leather' could still be disposed of responsibly after use or whether it would become another product that does not decompose.

The article has highlighted references made to the economic possibilities and the invention of materials in the realm of the imaginary beyond any tangible materiality. The websites and the information made available constantly change before one's eyes, even during the research done here. It is puzzling why mycelium – which turns wooden and brittle when dried – should be used as a raw material substitute for leather – beyond the use of its evocative effect. Rather, mycelium-'leather' apparently performs in a similar manner as the virtual materials described above: they exist mainly in a dimension beyond their own materiality. As Küchler (2015) also writes, even in this ideal state they still add to the value of the sizable materials industry. They are presented in their material state, but the qualities of the materials and projections of their future uses are largely mediated and outlined on the companies' websites, which could be characterised as honeytraps, and in echo chambers in other media. As such, the use of sustainable materials develops its own discursive momentum, with a large symbolic dimension, due to their potential future use in fashion. The list of such materials can easily be multiplied and marketed, and it has commercial potential – trying to attract some of the larger investments made in the sector. Since it is expensive to produce innovative materials, they need constant marketing – as was the case for the newly marketed synthetic fibres mentioned above. Companies have been able to generate a great deal of interest and also much funding for their research, though with relatively few products to show for it. There is an urgent need to address exploitative and cruel production practices, including the use of animal hides.[24] It can be concluded that the market *is* ready for this idea. Maybe that explains the lack of demand for empirical knowledge in this field. For the future of fashion, however, there needs to be more certainty. The effort to create mushroom-'leather' and the ideal already being outlined does, however, give fashion enthusiasts reason to hope that consumption practices can meet the ideal of a sustainable product.

ACKNOWLEDGEMENTS

I would like to thank my colleagues, Norbert Henzel and Johannes Stoll, for their inspiring input during my research for this article.

24 It has been suggested that one of the problems might be scaling production, too (Pucker 2023).

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Voices and Practices in Research – The XII Finnish Ethnology Days, Helsinki, 14–15 March 2024

Aino Laiho & Sauli Okker

One of the main principles in ethnological research is to give a voice to research participants. On the other hand, researchers also possess unique voices. This challenges us, as researchers, to reflect and understand the ways in which we influence the world through our studies, raising questions such as: where and how are the voices of our research heard? Whose voices are heard, and who listens to them? What kind of research is valuable?

These questions inspired the XII Finnish Ethnology Days' theme this year: Voices and Practices in Research. The annual conference, organised by the *Association of Finnish Ethnologists Ethnos ry*, took place this year in Helsinki at Tieteiden talo (the House of Science and Letters). The two days included three keynotes, eight workshops, one experimental affect workshop and an evening get-together with dinner at the Helsinki City Museum. The conference gathered 140 participants to reflect on the voices of ethnological research. To stay with the theme, the voices of this report are Sauli Okker (SO), who gave a presentation during the conference, and Aino Laiho (AL), who is a first-time attendee of the Finnish Ethnology Days.

After a warm welcome from the organisers, the first conference day started with a keynote introducing the main topics of the conference. Fataneh Farahani, professor of Ethnology at Stockholm University, delivered a keynote titled 'Diasporic Epistemic Vulnerabilities: Troubling the concept of voice within the compulsory Eurocentric knowledge production'. It critically explored the concept of 'giving voice' in academic settings and aimed to move beyond mechanistic and singular approaches, as well as the romanticisation of this notion. Does being granted a voice automatically mean receiving power too? Not necessarily, she argued, as this may lead to 'representational tokenism', whereby the so-called 'white we' decide to practice white hospitality towards marginalised groups and choose how and to whom a voice is given, causing narratives to become singular.

(AL) Although I am ethnically white and European, due to my position as a Deaf person and signer, Farahani's examples and thoughts were not completely unfamiliar to me. I eagerly wrote down useful terms in my notes, such as 'unhomed', and 'racialising academia'. Farahani quoted Poppy De Souza when referring to "willfully mishearing white ears". Coincidentally, I

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 111–115. https://doi.org/10.23991/ef.v51i1.145478

found it quite fitting in my case, because as Farahani points out, white individuals, and in my opinion, hearing and non-disabled individuals as well, have the privilege to appeal to ignorance and expect education from marginalised groups.

(SO) After lunch, the program continued with the first workshops. The workshop titled 'Moniäänisyys ja äänettömyys terveyden ja hyvinvoinnin määrittelyissä' ('Multivocality and silence in definitions of health and well-being') contained presentations about voices of people with disabilities, high school students' voices about well-being, and two presentations on voluntarily childless people. The workshop started with Kia Liimatainen's presentation about her ongoing dissertation research on people with disabilities and their experiences of transition to work, in which she plans to analyse the data together with research participants. It will be interesting to hear about her experiences with this inclusive method of analysis at a later time. Nina Väkeväinen gave a thought-provoking presentation about the sterilisation processes of voluntarily childless people. After presenting their voices, Väkeväinen proceeded to the voices of doctors. In my personal "social bubble" and in the media, the discussion is usually limited to voluntary childless perspectives or people with opposing opinions, which made hearing about doctors' perspectives a welcome addition.

After the afternoon coffee break, Tytti Steel from the University of Turku gave a keynote titled 'Osallistavat menetelmät ja tutkimuksen vaikuttavuus' ('Participatory methods and the impact of research'), which engaged with the terms of participation and inclusivity, which are currently ubiquitous in the field of humanities. Steel spoke about participatory methods as an inclusive form (osallistava), which can also be understood as a way for researchers to give a voice to participants or to topics that touch participants' lives. Steel's thought-provoking keynote highlighted numerous ethical questions, such as how researchers might overemphasise the vulnerability of research participants. This encouraged me to think further about the importance of reflecting on our positions as researchers when conducting participatory methods, as they involve power hierarchies by default: the researcher is in a position of authority and the "middleman" by implementing the participation process.

The first day ended with a get-together at the Helsinki City Museum, with a delicious vegan buffet and the Ethnos award ceremony, which Helsinki City Museum's intendent Mikko Teräsvirta awarded to Kamilla Billiers from the University of Helsinki. The evening concluded with Alice Aloof's folk music, and I was fascinated by their 'reggae-ish'– melancholy but danceable – adaptation of the Finnish folk tune "Juokse sinä humma".

The second day started with a morning workshop titled 'Moraalisesti haastavat tutkimuskohteet' ('Morally challenging research topics') that discussed themes of fascists, incels, football ultras and Finnish "gangsta rap". These themes raise ethical concerns about how to handle voices coming from controversial fields. For example, it is a very relevant question to what extent a researcher wants to make fascists' voices heard when their agenda might be to push their message into public discussion.

(AL) I joined the parallel workshop dealing with voices in the museum, 'Äänet museossa: Kenen äänet museossa kuuluvat, miten museon ääni kuuluu?' ('Voices in the museum: Whose voices are heard in the museum, how does the museum's voice sound?'). Karoliina Autere connected the well-known wheel of privilege and power diagram in her presentation about the dynamic museum with ideas of inclusivity and participation, through which, in the best case, power imbalances are evened out. As Autere addressed, that will also mean that some people will lose their power and privilege. Under this premise, are we ready to give space to the oppressed or marginalised? If before I was hesitant about working in or with museums, this thought-provoking session made me reconsider my doubts. Museums can serve as places where norms are questioned and where new ideas are built, and I would love to be part of that process. Helena Laukkoski's presentation on the business-based museum, blurring of museum boundaries and the concept of experience taking space generated the most discussion during the workshop.

The afternoon continued with the second session of 'Moraalisesti haastavat tutkimuskohteet' ('Morally challenging research topics'). Jaana Ahtiainen's presentation concerned the challenges in researching commercial sex, during which she highlighted issues such as terminological decisions, stigmatisation and the power of gatekeepers as informants and contact persons. Due to the sensitivity of the topic and the hierarchies among society and sex workers, it may happen that some voices remain hidden while others, often those of the gatekeepers, are emphasised. Aila Mustamo presented a paper on researchers' drug and psychedelics experiences; the (privileged) positions of the researchers depending on their background were recognised as well. Sauli Okker's presentation gave insight into his research on unauthorised rave-parties and reflections on research ethics regarding encountering subcultural communities. He mentioned the term 'heterotopia', which means a space for the alternative action, and which he uses as a theoretical tool to explain how and why the social space of rave-parties differs, for example, from parties at the legitimated venues. All three presentations dealt with the position of the researcher with regard to the informants versus within academia, and the process of gaining informants' trust.

The last keynote speech was held by Sharon Macdonald, professor of Social Anthropology at the Humboldt University of Berlin, and provided a good summary of the previous keynotes, workshops, and the issues raised in them. While Farahani warned in her keynote speech about (white) researchers' hegemony and singularising narratives, Macdonald spoke about a long-term, multi-researcher project at Berlin museums (2015-2022), which had taken these points into consideration. One of its aims had been to investigate the best practices for hearing or sensing multiple, diverse types of voices.

An interesting term she used was "recursivity", which we should move towards from simple one-way reflection. As described in the keynote, recursivity could be seen as the perfection of a hermeneutic circle, whereby different perspectives take an active role and uphold a continuous discussion with each other, redefining and re-creating meanings. Macdonald also showed a video titled 'Who is ID8470?' that combines art and research and was produced as a part of the project mentioned above. The message in the video, in short, was how it is the institutions', like the museum's, responsibility to reflect both on the dilemma of representation and on the reception by the target audience. Moreover, Macdonald noted that ethnographic understanding plays an important role when defining the value of museum collections: what will be shown, what hidden, and what will be destroyed? What practices enable or disable making voices heard or sensed not only today, but also in the future?

(AL) As I reflected on the event afterwards, I noticed that choosing between workshops was a major but positive dilemma. I found myself gravitating towards some based on personal interest, but also those relevant to the current phase of my studies. However, my biggest motivation was "the desire to help one's own community", as depicted in a photograph presented during Macdonald's keynote speech, showing the slogan written on the entrance to a German museum ("Ich kümmere mich um mein Umfeld"). The alternative entrance was marked with the text "Ich sorge mich um die Welt", with English text "I want to help the world". In that sense, I believe that some Deaf-related research projects would have been suitable for these workshops, as many utilise ethnographic methods, but above all, they address the theme of the Ethnology Days by highlighting 'voice' in an unconventional way. Deaf-led studies perhaps could force us to consider the definition of 'voice' from a different perspective.

(SO) My thoughts after the conference can be summarised as that I felt very welcomed by the reflective atmosphere of the Ethnology Days. The aim of my own presentation was to ethically prepare ethnographic fieldwork that

will be conducted later this year, and the workshop, as well as informal conversations during lunches and the get-together dinner, proved to be the best imaginable environment for this aim.

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A Life-story of a Professorship

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Nordisk etnologi 1921–2021: Ett ämne i rörelse [Nordic Ethnology 1921–2021: a University Subject in Motion]. Fredrik Nilsson & Anna-Maria Åström (Eds). Åbo: Åbo Akademi University 2021. 447 pp. ISBN 978-951-765-998-7 (print), ISBN 978-951-765-999-4 (digital).

In 2021, the Åbo Akademi University was celebrating a hundred-year-old university chair of the Nordic Ethnology, or the Kiseleff Professorship, after the donator Feodor Kiseleff, a wholesaler. This centennial publication is not an ordinary history of a university chair, but a life-story, writes Professor Fredrik Nilsson (435). It is to draw a picture of the birth, metamorphoses, and permanent traditions of the university subject. Like life-stories in general, it creates history, although, the picture of the past is selective and inaccurate. Instead, the features of continuity and constant forward movement in space and time emerge. The starting points for discussions are the available facts, memories and experiences of students, doctoral students, researchers, archive personnel and professors, as the editors, Fredrik Nilsson, and Professor Emerita Anna-Maria Åström write (8).

The book is divided into three sections, consisting of twenty-one articles including the preface and after-words. At the end of the book, fifteen authors are presented. The first section, 'Development and everyday life of the university subject,' covers the history of the university chair including the professors in successive order, establishing the archives and archival practises, the emergence of research specializations and transformations in education. Moreover, the connections to the general development of ethnology in Finland, to related institutions and associations, and to the colleagues in European and Nordic countries, explicit in Sweden, are discussed. Fredrik Nilsson, and Anna-Maria Åström, or both together, have drafted most articles in the chapter. Moreover, Professor Nils Storå discusses how ethnology in Finland developed along five paths; Ph. L. Katja Hellman and Docent Sanna Lillbroända-Annala are discussing the meaning of students first field work and Doctoral Student Ann-Helen Sund ethnological dissertations.

In the second section, 'Interfaces and collaborations,' development issues are discussed through the relationship between ethnology and related activities. Fredrik Nilsson writes about the Institute for Nordic Ethnology at the Åbo Akademi University, established 1927; Fredrik Nilsson and Docent Blanka

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 116–119. https://doi.org/10.23991/ef.v51i1.144618

Henriksson write about the Nordic Folkloristic, and the joint candidate programme for folkloristic and ethnology in cultural analysis; Doctoral Student Bettina Westerholm discusses working with questionnaires at the Cultura, the Cultural History Archive at the Åbo Akademi University, established 1953. All these articles have explicit links to the development of the university subject. Instead, in Ph. L. Kasper Westerlund's article about the Institute of Maritime history at Åbo Akademi University, in Professor Helena Ruotsala's article about the European Ethnology at the University of Turku, likewise in the article concerning national sciences by historians Ann-Catrin Östman and Nils Erik Villstrand, common interfaces and development lines are in the foreground.

The third section of this book, 'Research topics,' such research directions with a prominent position for the university subject are discussed. Fredrik Nilsson discusses Garbriel Nikander's research related to society-oriented ethnography, Anna-Maria Åström ethnological research related to mansions, and urban research from the perspective of modern time; Ph.D. Anna-Liisa Kuczynski writes about cultural encounters and ethnicity, Ph.D. Ann-Charlotte Palmgren about gender and sex in ethnological master's theses, and Ph.D. Sonja Hagelstam about ethnological cultural history.

The structure of the book makes it possible to follow the development of the Nordic orientated ethnology nearly a hundred years, ever since cultural historian Gabriel Nikander (1884–1959) was appointed the first holder of the Kiseleff Professorship – officially the Nordic Cultural History and Folklife Research – until the year 2020. In his inaugural lecture, in 1922, Nikander discussed the tasks of the university subject and the professorship, in Swedish-speaking Finland. He stressed that both immaterial and material culture should be documented. Together these were supposed to reflect an archaic, authentic Swedish folk culture in Finland, and manifest a common collective understanding about the world. In this, the university subject was seen to serve the society. The collaboration with the museums formed the media, and the ethnographic fieldwork a method, which gave the research a scientific label and distance to non-scientific research on local history. To be able to avoid romantic descriptions of folk life, Nikander emphasized the critique on sources and plead for realism when cultural patterns were formed in economic or political conditions. He also stressed the importance of the historical perspectives, for understanding folk culture was not possible only by conducting the field work on the present. Reaching the past demanded field working with archived documents, which a collaboration with the Society of Swedish Literature in Finland could offer. (436)

In 1953, Nordic Cultural History and Folklife Research got a new professor, Helmer Tegengren (1904–1974). He built his program on the basis of his

predecessor by stating that the university subject was on the service of the Swedish-speaking minority in Finland, and continually collaborating in the surrounding society. Documenting the folk culture was necessary because of the existing, but scarce and one-sided material. Collected material was to be organized, archived, and made available to scientists. His Swedish colleagues had assured him that without archive neither ethnological nor folkloristic research would be possible. In the same year, Tegengren established a new archive, the Cultural History Institute at Åbo Akademi University. The collecting method, postal questionnaires, elaborated complementary to traditional field working. A network of local informants was recruited the Swedish-speaking coastal areas of the Baltic Sea. The collected material composed oral tradition, drawings, and photos. Expeditions were arranged for students who learned the field working and collecting materials. Tegengren was also widening the research area to arctic and subarctic cultures. In this respect, the difference between Tegengren and his predecessor was evident, but also in the cultural theory: Nikander had concentrated on cultural spreading, and Tegengren had diffusionism as the premise. He discussed the meaning of cartography, and main roads, along which both materials and other cultural features could be transmitted. In his memorandum concerning the university chair of Nordic Cultural History and Folklife Research, likewise the Cultural History Institute, he stated that Folklife Research, as a branch of science was a historical discipline working with a comparative method and with fluctuating materials, such as historical documents, literature, folk tradition, and artefacts. As a central problem, he mentioned the way cultural elements were created, flourishing, and moving as loans and in acculturation processes, and how the elements also faded and disappeared.

The university subject was influenced by ethnological perspectives, and increasingly shifted towards the study of social challenges, such as the class and urban cultures of industrial society. Because of this development, the next professor, Nils Storå (1933–2023) requested a conversion of the Kiseleff professorship to the Nordic Ethnology and Folkloristic in 1974. (47–49). In 1972, when he was nominated as a professor, ethnology in Sweden was turning towards social anthropological perspectives and more hermeneutical approaches, likewise reflections on the role of the researcher. Everyday life and urban culture were taken as research subjects as a part of modernization, in both local universities. (78) Cultural history was still a part of studies, likewise the anchorage to agricultural and maritime cultures. This meant new theoretical orientation which understood people as active creators of culture rather than passive culture carriers. Culture was seen as a process. This perspective was taken to teaching ethnology, and later on, it also permeated the research.

In late 1990s theoretical premises were semiotics, historical-anthropological and constructionist perspectives on ethnic identity, and modern way of life, likewise in towns and countryside. Also, relations between nature and culture were studied in the archipelago from the point of view of pollution. To an extent, this shift foreshadowed the postmodern, norm-critical approach that now shapes ethnology in Turku, as well as in the Nordic countries and in Europe. Anna-Maria Åström, a professor since 1999, was developing the university subject by building on her predecessor's work. The discursive turn, likewise, bodily, spatial, and affective turns, have been notable in this context as well as the latest, post humanist or material turn, which should be highlighted as principally important for a university subject, oriented from the beginning towards the material culture. At the end of the book (442–443) the latest directions, like medical humaniora, performative border studies, and critical animal studies are mentioned in the context of ongoing projects.

In conclusion, this life-story of the Nordic ethnology, is clearly bringing forth continuities and constant forward movement in space and time. The changes since the 1950s, and especially the 1970s, suggest potential shifts in the paradigm, but the gradual progress of transformation seems likely. In spite of that expressed uncertainty, the otherwise rich contents of the book with the multiple perspectives make the reading enjoyable. Despite concentrating on one university chair, the book gives a wide perspective to Finnish ethnology.

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A Comprehensive Toolkit for Qualitative Research in Cultural Studies

Elisa Kurtti

Outi Fingerroos, Konsta Kajander & Tiina-Riitta Lappi (eds.) 2022. *Kulttuurien tutkimuksen menetelmät*. [A Book of Methods in Cultural Studies.] Helsinki: Suomalaisen Kirjallisuuden Seura. Tietolipas 274. 429 pp. ISBN 978-951-858-571-1 (print) ISBN 978-951-858-572-8 (electronic) ISSN 0562-6129 (print) ISSN 2670-2584 (electronic). https://doi.org/10.21435/tl.274

Conducting qualitative research in the humanities requires a myriad of skills and knowledge about how to not only produce new understandings of social and cultural phenomena but also to construct the premises for asking why and by what means, make basic assumptions and recognize the constraints impacting such research. A timely and relevant overview of the issues affecting qualitative research can be found within the covers of a single book, *A Book of Methods in Cultural Studies,* edited by Outi Fingerroos, Konsta Kajander and Tiina-Riitta Lappi, a study that addresses and resolves such challenges with flying colours. The book is a collection of articles on currently relevant discussions in humanistic culture research on the best methods for studying cultural phenomena. It can be used as a textbook and method guide for students and researchers doing qualitative research, especially in the field of cultural studies. It includes articles by authors from the fields of ethnology, anthropology, digital culture research, study of religions and folkloristics and is divided into an introduction and five sections containing a total of 21 chapters.

The book encompasses central aspects of the research process: it starts by introducing the scientific traditions in cultural studies, including *paradigms* and *agenda jumps* (chapters one and two) as well as ethical considerations and data management (chapters three and four, but both themes are also addressed later in the book). It then proceeds to the central role of fieldwork (chapters five to eight), after which it addresses various methods of data production (chapters nine to thirteen) and text analysis (chapters fourteen to eighteen). The last two chapters focus on the process of writing scientific texts and provide guidelines on how to write successful research proposals and funding applications.

The book is defined as a *kaleidoscopic peek* in the sense that it covers topics deemed relevant in contemporary cultural studies, but it is not intended as an 'all-encompassing introduction to every method and theoretical frame-

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work' used in the field (10). The reader is given practical tools, such as textboxes that provide useful information and checklists to help the reader carry out their own research successfully. Many chapters also include data extracts, pictures and examples of how they have been analysed, or otherwise used, in qualitative studies with varying analytical focuses and employing different methods. The main chapters concern observation and interviews (179–205), audiovisual methods (206–231), sensory ethnography (236–258), using archive materials (321–328), discourse analysis (329–350) and magazine data (351–354), to mention a few. References to extra readings are also provided for those who want to learn more about the phenomena addressed in each chapter.

The collection of articles has a clear structure and introduces central concepts and methodological approaches that proceed logically throughout the entire book. The core approaches include what the authors call an *ethnographic attitude*, meaning 'curiosity, attraction of the unknown, interest in the familiar and the everyday, and questioning of the self-evident' (10–11). The ethnographic approach involves interactive *fieldwork* that stems from theory (119–138), i.e. *reflexivity* (e.g. 56), which refers to the researcher's open and active evaluation of their research process and an awareness of their own role and relation to the field. It builds on *hermeneutic* epistemology, where the creation of new understandings occurs via interactions between the researcher, the study participants, the data and the process of interpreting it (51). It involves dialogue and synthesising the *emic* (experiences and perspectives of the study participants) and *etic* (theories used for analysis) perspectives on cultural phenomena. *Culture* is approached in the book as a 'framework for interpreting human action, which people use to structure the world as a meaningful and sensible whole' (49).

The authors introduce a broad variety of theoretical and methodological background literature from both cultural studies and the social sciences and delve into a variety of research strategies and analytical methods. Some are more materially oriented (e.g. the embodiedness of experience in sensory ethnography, 236–258), while others are more constructionist in nature (e.g. discourse studies, 329–350). The way in which the literature is introduced is evidence of the interdisciplinary effort informing the study: different traditions are compared and brought together. Also, ideas on how to combine different disciplinary approaches to form a more comprehensive understanding of a given phenomenon are introduced (e.g. the combining of cultural, ethnological and cognitive approaches is encouraged to deepen understanding of category research in chapter 18, 371).

The authors emphasise the importance of careful planning before carrying out ethically and legally sound research. Chapters three, four and fifteen

especially cover ethical consent, informed participation, data management, archiving and legislation – topics that require consideration and that may pose many practical challenges for researchers. The General Data Protection Regulation (GDPR) in particular, which provides the legal basis for collecting personal data and ethical consent, includes terminology that can often seem confusing to many young researchers. One proof of the book's timeliness is that it thoroughly addresses what each of these topics mean in practice for cultural studies research. Lifecycle planning of research data is one practical example of a space where legislation meets research ethical guidelines and data management requirements. Will the data be anonymised or stored with identifiers? Will it be archived, published or destroyed, and how does this relate to current open science practices? What possible challenges do the processes entail? The book prepares its reader to, for example, avoid data loss by reminding them to consider the archive's criteria for accepting research data already when planning the data management phase of the research (86 & 323).

The authors apply an ethnographic approach to their writing. Their text speaks to its reader and is easy and pleasant to read, producing as sense of safety and encouragement with respect to the research process. The authors' reflexivity shows through especially in the humane way the book approaches sensitive research topics and the need for researchers to contemplate their own role in data formation; it likewise addresses the challenging aspects of doing research, such as writing difficulties or recognising that researchers can become discouraged and doubt themselves. One central message given to the reader is that learning via doing is at the centre of ethnographic research, and each researcher's expertise grows through the process of interacting with others in their field. The book often feels like the friendly encounter one needs when their inner critic has seemingly overwhelmed them.

Though the writing is reflexive in most parts, some sections could have been addressed differently. Chapter 16, on discourse studies (346), makes the following claim:

> If the goal of a researcher is to make interpretations of some reality outside of language that the use of language is thought to reflect, discourse studies is not the right approach: by its very nature, one cannot access what the divorce process means to the writer, what kind of gender-based discrimination people have experienced or why action has been taken against climate change.

While one can agree with the notion that discourse studies can only provide a limited understanding of, for example, people's personal experiences, it does not mean that discourse studies is adopting the *incorrect* approach to trying to better understand people's experiences or the reasons behind their actions.

In the book *Discourse analysis* (2016, 233–235), Eero Suoninen writes that while linguistic depictions of things, *accounts,* make it possible for people to understand each other, people also form their accounts based on the already available resources for making such things understandable. While these cultural resources are available to people for meaning-making, people's own accounts can also shape how the world is understood after the accounts have been presented. Thus, accounts can also be seen as playing an integral role in the upholding of culture: they maintain social structures and discourses and have various symbolic and material consequences (Suoninen 2016, 233–235) If language is thus seen as something that enables the shaping of culture, and as something that can also have material consequences, then it seems justified to challenge the notion that the study of discourses cannot extend beyond language. However, as the authors of chapter 16 also note, discourse studies include a multitude of approaches, some of which lean towards more extreme forms of constructionism. It is still possible, though, to apply discourse studies in other ways, some of which can also provide better tools for accessing the world beyond language. To lean on the authors' own words, the key is to give a detailed enough definition of one's approach and to 'locate one's research in the field of discourse studies' (346–347).

The book concludes with the realistic observation that before beginning the research process, one must also be successful in the fierce competition for funding, which often requires multiple attempts at writing a successful application. Despite ending with a focus on such harsh realities, the book manages to do it in a supportive manner. The ending could have benefited from a closing chapter that clarifies the central points of the book and motivates the reader further in their future research efforts, but this does not diminish the authors' achievements. Overall, the book provides a timely overview of relevant methodology-related topics in ethnology and related disciplines. It offers guidance and support for researchers on exploring their own approach to cultural studies, on finding their own academic path, and it offers them some tools for blazing such a trail. It inspires and gives hope for the future, while acting as a great example of the strengths of the humanistic approach for writing and doing research. I warmly recommend it to students and researchers doing qualitative research, and to anyone want-

ing to understand more about cultural studies and how the field is related to other disciplines.

AUTHOR

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Family life within the making of a welfare state

Lina Metsämäki

Jonas Frykman & Orvar Löfgren 2022. Kärlek och kärnfamilj i folkhemmet: längtan, lust och oro. [Love and nuclear family in folkhemmet: longing, desire and worry]. Malmö: Gleerups. 236 pp. ISBN 978-91-511-0841-4

In the book "Kärlek och kärnfamilj i folkhemmet: längtan, lust och oro" (Love and Nuclear Family in Folkhemmet: Longing, Desire, and Worry), Orvar Löfgren and Jonas Frykman examine the twentieth century's transformation into the era of the nuclear family. They investigate the normalisation of the nuclear family in Swedish everyday life from the 1930s to the 1960s and its central role in the construction of the Swedish *folkhem*. *Folkhemmet*, translating to "The People's Home", embodies a welfare concept signifying the establishment of the welfare system in Sweden, rooted in the idea of societal cohesion akin to a large family, in which all members contribute and care for one another.

Through this thematic lens, the authors seek to extend their earlier work, "Den kultiverade människan" (The Cultivated Man), published in 1979, which delved into the emergence of bourgeois culture in the late nineteenth century. Their current book shifts its focus to the family in mid-twentieth century Sweden, commencing in the 1930s. They characterise this period as marked by both anxiety stemming from societal upheavals, and optimism fuelled by a desire for societal reform. The authors' analytical emphasis lies in examining the practical manifestation, perception, and experience of the nuclear family, probing how it attained the status of an unquestioned mode of living. They depict the emergence of the nuclear family as a gradual revolution. The introduction culminates in two visits to the authors' own basements, revealing familial histories and material artifacts. The book concludes in the 1960s, a time when the nuclear family faced challenges, and alternative family structures such as patchwork families or unmarried cohabitation began to emerge.

The book comprises six analytical chapters, each illuminating various aspects of daily life revolving around the nuclear family concept during this era. Accompanied by photographs from the period, these chapters explore diverse facets of life. The first chapter centres on courtship rituals, depicting interwar youth culture encompassing dances, movie outings, and the liber-

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 125–128. https://doi.org/10.23991/ef.v51i1.143873

ating role of bicycles in enhancing mobility and freedom. This period witnessed evolving consumption patterns, access to new spaces, and the rise of media culture, fostering an atmosphere of romance and aspiration. However, these shifts in youth culture often led to intergenerational tensions and a moral panic regarding youth conduct. The subsequent chapter builds upon earlier work by Frykman (1988), addressing these moral anxieties and the oppositional worldviews between generations. Older generations believed that young people's frivolous habits threatened the basis for the building of the new Swedish *folkhem*: a robust, growing population. They feared that without more children being born within marriage, in combination with their preferred reduction of births outside of marriage, the population decline would threaten the construction of a welfare society. The fear of population decline and societal destabilisation spurred an emphasis on the nuclear family as a solution to preserve societal cohesion. The younger generation was also moving towards the nuclear family, but their motivation was driven more by longing and desire. Despite the fears of the older generations, this led to more marriages and more children being born, resulting in the post-war generation becoming the largest yet, commonly referred to as the baby boomers. Urbanisation, mobility, and evolving lifestyle norms further influenced the rise of the nuclear family.

The third chapter, titled "Flytta ihop", meaning 'moving in together', delves further into the establishment of a home. Here, the authors explore how families were organised in their everyday lives and under various living conditions, highlighting the cramped living spaces many families endured during the interwar period. The role of the housewife becomes central in this context, as she navigated the densification of home and family life while also shouldering the responsibilities of raising children. The subsequent chapter centres on the theme of sex life and its regulation by authorities. This realm became a subject of well-intentioned advice and warnings from authorities, emphasising the need for accurate information and hygienic practices around sex, underlining its presumed importance for a successful marriage. Illegitimate children were perceived as a threat to the nation, both in terms of the quality and quantity of the population. As a response, authorities advocated for children to be born within wedlock, in appropriate numbers, and at the 'right' time. Consequently, married women became defined by their ability to bear children, and sex was intricately linked with duty and responsibility.

The fifth analytical chapter examines the post-Second World War era and its transformative impact on family life in Sweden. With the advent of the welfare society, families experienced radical changes, including modernisa-

tion of living spaces, increased purchasing power, and leisure time. Frykman and Löfgren explore not only the material transformations, but also how these changes affected different social strata, and how hierarchies were subtly communicated through gestures such as looks, moments of silence, or shrugs. In the final chapter, the focus shifts to family traditions and how the nuclear family served as the cornerstone for the ritualisation of everyday life through various celebrations. Using Christmas and children's birthday parties as examples, the authors offer a class perspective on these traditions. The book closes with a brief concluding chapter.

While the authors draw on previous research, notably acknowledging contributions from colleagues in Lund, the discussion of this research is relegated to a brief appendix, making the scientific exchange somewhat untransparent. This decision enhances accessibility for non-academic readers, but may obscure the distinction between original research and existing scholarship, and makes it harder for academic readers to appreciate the authors' contribution to a larger research context. Additionally, the book's methodological approach, characterised by a bricolage method, could benefit from a more expansive discussion. The authors employ various sources, focusing on peoples' actions rather than their words, while also considering how the family has been portrayed in public debates and reform programs.

A notable strength of the book lies in the authors' evocative language, effectively capturing the zeitgeist of the examined decades and offering readers a vivid portrayal of daily life during that period. This aligns with their aim to study experience rather than discourse, focusing on lived reality rather than representations. However, the narrative's homogeneity overlooks diverse experiences, particularly those of women and minority populations. Even though the authors consider factors such as class, gender, and different generations to some extent, women's voices are predominantly heard in the chapter about sex life, with their experiences as mothers or wives outside of the bedroom receiving minimal attention. Even if this time could be described as the golden era of the housewife in Sweden, some women did work outside the home, but this is not given much attention in the book. The authors also mention children born outside of wedlock, but the experiences of these children or their mothers are not addressed. Immigrant and minority populations are also largely omitted from the analysis. Despite these limitations, the book provides a rich overview of Swedish family life in the middle of the 20th century, offering insights into the evolution of family norms and the construction of the Swedish *folkhem*.

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New study explores the formation of vernacular garden culture in province of Kainuu in northeastern Finland

Kati Mikkola

Marjukka Piirainen 2022. *Kansan ja kasvien kasvatusta. Puutarhatieto kainuulaisen pihakulttuurin muutoksessa*. [Cultivation of People and Plants: The Horticultural Knowledge in the Transformation of Domestic Gardens in Kainuu] Dissertations in Education, Humanities, and Theology 189. Joensuu: University of Eastern Finland. 197 pp. ISBN 978-952-61-4671-3 (print) ISBN 978-952-61-4672-0 (PDF) http://urn.fi/URN:ISBN:978-952-61-4672-0

In her doctoral dissertation entitled *Kansan ja kasvien kasvatusta. Puutarhatieto kainuulaisen pihakulttuurin muutoksessa* [Cultivation of People and Plants: The Horticultural Knowledge in the Transformation of Domestic Gardens in Kainuu] Marjukka Piirainen examines how horticultural knowledge spread and how home gardens evolved from the late 19th century to the 21st century in province of Kainuu in northeastern Finland, especially the municipality of Kuhmo in the eastern part of the province. The temporal scope of the study is broad, yet its focus on a specific, relatively delimited area enables a comprehensive and in-depth examination of the research subject.

An examination of rural development brings a new perspective to the study of Finnish garden culture, which has thus far been focused on the southern and western parts of the country, particularly on public, communal, and upper-class gardens. Gardening has been practiced in old cultural areas of Finland for hundreds of years, but in Kainuu the garden culture is relatively young as garden plants started to become common only in the early decades of the 20th century. Piirainen's study brings to light the pivotal role of women in remote rural areas in the transformation of local environmental culture, a role that has been largely overlooked in previous research and local histories. Simultaneously, it reveals the 'marginality' of garden culture and draws attention not only to voices but also to silences – the absence of garden discourse in local historiography.

The study is a compilation thesis consisting of an introductory overview and four peer-reviewed research articles published in Finnish periodicals (*Elore*, *J@rgonia*, *Kasvatus & Aika*) and an anthology (*Etnologinen tulkinta ja analyysi* [Ethnological interpretation and analysis], published by Ethnos ry). The article "Puutarhapuhetta ja puheen tulkintaa" [Garden discourse and discourse interpretation] is methodological and reflective in nature. The other three articles – "Kaswutarha – hyötyä, huwitusta ja siweyden tuntoa" [Garden – utility, pleasure, and sense of virtue] , "Ruskoliljoja ja raparperia" [Autumn lilies and rhubarb], and "Perukan tytöstä puutarhayrittäjäksi" [From a village girl to a garden entrepre-

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ETHNOLOGIA FENNICA Vol. 51 (2024, issue 1), 129–131. https://doi.org/10.23991/ef.v51i1.143855

neur] – form a chronological sequence from the 1860s to the 2010s, progressing from a national level to a local level and then to an individual level. The main title of the thesis, "Kansan ja kasvien kasvatusta" (Cultivation of People and Plants), juxtaposes the central themes of the study: popular education and changes in domestic environments. Simultaneously, it subtly connects the spread of ornamental plants and new food crops to the construction of the Finnish nation.

Piirainen's research is situated within the perspectives and methodologies of folklore studies and cultural studies. Additionally, she constructs the context of her research through cultural history and, in part, by employing terminology from sociology. Piirainen's study is empirical and qualitative in nature, aiming to both understand and explain the evolution of garden culture and gardening practices in the yards of small-scale farms. The main research methods of the study are content analysis, historical contextualization, and discourse analysis. The reflection on the researcher's own professional horticultural knowledge and its utilization within the realm of cultural studies is a distinct characteristic and strength of the work. Regarding the use of interview data, a notable aspect of the study is that one of the key interviewees is the researcher's own mother – Piirainen also intriguingly reflects on how this influences the interviews and the study.

The study is based on a diverse and extensive dataset, which forms a well-founded entity. The principal sources of data for the study include gardening books published between the 1860s and 1930s (40 books), as well as oral history material compiled by the author between 2008 and 2018, generated not only through research interviews but also various gardening-related events. Additionally, the study has utilized interview data produced by others, photographs and drawings, yard plans, press clippings, minutes of local associations, and local histories, as well as other background materials.

In the research, oral history is approached both as autobiographical narrative constructing personal history and as a source of information about the past. However, it is noteworthy that the research focus is not directed towards the narrative itself or the way of producing the past through reminiscence, but rather on "the remembered time and the actions and experiences of the narrator's former self in their own time." (35) The issues related to the nature of oral history have been deeply explored in many recent studies, and this reflection would have been welcomed more in this study as well.

Drawing on current ethical recommendations, Piirainen has opted to adhere to a line of anonymity in her research (with the exception of Piirainen's own mother), aiming to protect the informants. However, it would be beneficial to delve deeper into the issues related to anonymization from alternative perspectives, such as considering what anonymization means in terms of interviewees' agency, as well as the implications of the absence of personal names and loca-

tions in a study focused largely on describing the development of a single locality, with the goal of also returning research findings to the local level. An alternative approach could have been justified.

Overall, Piirainen's research complements Finnish garden culture studies in an intriguing manner. The study reveals both deliberate popular education efforts and multifaceted interpersonal networks behind the spread of garden plants and horticultural knowledge. The analysis in the study explores the reasons for both the perceived slowness of changes and the adoption and breakthrough of innovations. Gardening was promoted in Finland at the turn of the 20th century by various institutions, such as Kansanvalistusseura (The Finnish Lifelong Learning Foundation), Suomen Talousseura (The Finnish Economic Society), 6 agricultural societies, and Marttajärjestö (The Martha Association). The study vividly illustrates that the transformation over a hundred years from open yards to gardens, and especially elaborate ornamental gardens created by horticultural enthusiasts, has been great in Kainuu, and that women played a central role in it – including their activities in homes, in occupational tasks in the gardening sector, and as promoters of horticulture in teaching and advisory work. Simultaneously, the study also demonstrates the resource redistribution between genders brought about by the development of garden culture.

Piirainen draws on both Finnish and international research in her study, but the literature heavily emphasizes Finnish research. A broader survey of research on rural garden cultures from around the world, for example, would have provided additional comparative depth and breadth to the study's observations and conclusions. However, by illustrating the formation of vernacular garden culture in Kuhmo, the study sparks curiosity regarding the extent to which similar or divergent developments have occurred in other remote areas in different countries.

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Kati Mikkola works as communications director in the Finnish Literature Society and has a title of docent in folklore studies at the University of Helsinki. She received her doctorate in comparative religion at the University of Turku in 2010. In her research, she specializes in the study of vernacular culture and the views of the national elite. Mikkola has studied vernacular attitudes towards new lifestyles in Finland, nation-building and self-taught folklore collectors, popular perspectives on secularization and transformations in religiosity, and the position of minorities in the archival policies of nationally-oriented archives in 19th and early 20th century Finland.

A much-needed handbook on university pedagogy in ethnology, anthropology, and related fields

Arja Turunen

Sanna Lillbroända-Annala, Maija Mäki & Pia Olsson 2023. *Kulttuurien tutkimuksen pedagogiikka*. [University pedagogy in cultural research] Ethnos publication. Helsinki: Ethnos ry. 514 pp. ISBN 978-952-68509-7-9 (print) ISBN 978-952-68509-8-6 (pdf) ISSN 0357-511X. DOI: 10.23991/ethnos.660

University teachers' pedagogical training as well as the study and academic discussion of university pedagogy have increased significantly since the 1990s. This has improved the quality of teaching and given researchers tools to develop and reflect on their teaching and academic identity. *Kulttuurien tutkimuksen pedagogiikka* (University pedagogy in cultural research), edited by Sanna Lillbroända-Annala, Maija Mäki, and Pia Olsson, is the first Finnish publication concerning university pedagogy in cultural research. It discusses the aims and methods of teaching and learning in ethnology, anthropology, folklore research, and the study of religions. The book is a highly valuable contribution to university pedagogy in general and to the field of cultural research in particular because this kind of pedagogical discussion – at least in the form of such a publication – has been lacking in the field.

The book includes 13 chapters and an introduction that demonstrate the multiplicity of courses, teaching methods, and pedagogical theories used in these fields. The days when cultural research studies mostly consisted of attending lectures and taking exams are long gone. The teaching environment has also changed dramatically over the past decades. Qualitative and quantitative requirements have increased in teaching, but at the same time students are required to graduate sooner, which leaves teachers struggling with conflicting interests in their teaching.

The identity of cultural research is based on ethnographic research, which students practice in courses on fieldwork methods. Ethnographic methods have traditionally been considered something that cannot be taught or learned in the classroom. Students have simply been sent to the field to learn them by themselves. As the editors of the book note, fieldwork methods have been passed down to new generations of scholars by citing the advice given by the first professor of ethnology, U. T. Sirelius, to his students: you will learn by doing (*työ tekijäänsä neuvoo*). Students and scholars of cultural research have since then learned to reflect on the collection of fieldwork materials in their

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theses and research reports, but we have lacked a pedagogical discussion and training concerning the teaching of fieldwork methods.

In *Kulttuurien tutkimuksen pedagogiikka*, this topic is finally discussed in several chapters that describe the aims of ethnographic research and the teaching of these methods to students. The chapters by Mitra Härkönen and Alexandra Bergholm, Outi Fingerroos and Riina Haanpää, Anne Häkkinen and Emmi Villman, and Eino Heikkinen provide various inspiring examples of how teachers have planned, structured, and taught courses of ethnographic methods, and how students have learned to acquire and develop their ethnographic skills. They also discuss the teaching and learning of ethnographic methods in the context of different pedagogical theories such as andragogy, connective pedagogy, and critical pedagogy. As all the authors emphasize, courses of ethnographic fieldwork are often the only opportunity for students to practice their future working life skills. The key to learning ethnography is, however, to provide students with tools to critically reflect on their experiences in the field. Fieldwork diaries and reports and meetings with students after their fieldwork give students an important opportunity to discuss and reflect on their experiences and what they have learned.

The emphasis on acquiring skills in fieldwork methods as a central part of becoming a professional cultural researcher was severely problematized during the coronavirus pandemic in 2020. How could our students practice interviewing and observation if they could not leave their home and go to the field? New kinds of web-based communication platforms such as Zoom and Teams were luckily available and used instead. The professional identity and skills of cultural researchers were nevertheless at risk as many aspects of face-to-face interaction in the field were missing. However, this created an opportunity to critically consider what the essence of ethnographic research and analysis of cultural phenomena was, as Anne Häkkinen and Emmi Villman argue.

Ethnographic methods form a significant part of the working life skills of cultural research students. After graduating, students of cultural research work in different professions in many fields, which makes the teaching of working life skills a complex question, but students often find it difficult to orientate to working life even in professions that are typical in our fields. The chapters by Outi Fingerroos and Riina Haanpää, Christer Eldh and Carina Sjöholm, and Pia Olsson and Terhi Ainiala point out that while students acquire many working life skills during their studies, they are not aware of possessing them if teachers do not help them to recognize, name, and reflect on their skills. Although students are "learning by doing," teachers are needed to help them understand what they are learning. Working with students and colleagues from different academic backgrounds has also helped teachers and students

of cultural research to see what makes their field and their skills special. It has also given new tools and perspectives for developing their skills further.

Orientation to working life and acquiring working life skills is a question that also concerns doctoral students, as the chapter by Maija Mäki and Hanna Nori shows. Doctoral theses are typically carried out as individual projects and not as a member of a research team like in natural sciences. How does one develop one's professional identity and contribute to the development of one's field if one is feeling lonely and isolated from other researchers and colleagues? These problems are far too easy to see as individual problems or ones caused by the difficult working environment of a specific department and university, but Mäki and Nori's chapter demonstrates that they are the result of the position of doctoral students in the contemporary university system. Doctoral students with a working-class background also often experience a feeling of being in an unfamiliar environment. Doctoral theses usually include a reflection on the research process, but it was refreshing to read a reflection on the whole process of and routes to becoming a doctor. In the future, doctoral students are supposed to graduate sooner. Mäki and Nori's chapter is an important reminder that the process of writing a thesis is not only a question of doing research. It is also a matter of becoming a professional in the academic world, which is very uncertain at the moment and does not give doctoral students the support – both economic and mental – that they need.

Although the role of ethnographic methods is emphasized in this book, as well as in the identity of cultural research, courses of ethnographic fieldwork comprise only a small part of teaching in ethnology, anthropology, folklore research, and the study of religions. The use of archival sources and archival research methods are also cornerstones of cultural research, and learning diaries and essays are still the most typical methods of study. Although they are extensively discussed in other pedagogical publications and handbooks of research methods, the chapters by Tuukka Karlsson and Viliina Silvonen, and Eeva-Liisa Bastman and her colleagues demonstrate that we need to recognize and critically discuss how archival research is taught, and what role the writing and evaluating of essays plays in teaching students in our fields.

The same applies to new methods of teaching, especially if they were originally designed to meet the needs of other disciplines. Particularly since the coronavirus pandemic, all modes of distance learning have become more common. Tiina Airaksinen and Anna-Leena Korpijärvi discuss the use of MOOC (Massive Open Online Courses) in the teaching of cultural research. These online courses were originally designed for the teaching of natural sciences, but as Airaksinen and Korpijärvi show, MOOC can also be used in the humanities with careful planning. However, this requires good skills in both information

technology and online pedagogy, as well as the ability to critically review new styles of teaching. As Airaksinen and Korpijärvi point out, the development of AI services keeps teachers busy developing new ways of ensuring that students are actually studying and learning, and not "copy-pasting". On the other hand, Josephine Hoegaerts shows how the possibility of using podcasts in teaching has opened up new possibilities in teaching and learning as well as acquiring new working life skills. As Hoegaerts argues, we do not learn only by reading, writing, and thinking but also through our senses – which is particularly important to remember as we analyze culture and work as professionals in the cultural field. Why do we continue to evaluate learning by asking students to write reports, essays, let alone theses, while in working life, we mostly present our work and its results by giving oral presentations?

I warmly recommend this book to all researchers and teachers in cultural research, as well as all those interested in university pedagogy. It is highly important for the development of both teaching and research that teachers and researchers discuss and reflect on their experiences of teaching. I am glad that ethnologists, anthropologists, and folklore and study of religion scholars have finally started this discussion. I sincerely hope that this is the first book in a series of publications on university pedagogy in cultural research that will appear regularly in the future. There are still many topics to discuss, and the discussion initiated in the chapters of this book deserves to be continued.

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