

# Handcraft as Time Travel

BY LARS ERIK NARMO

## Abstract

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According to the theory of special relativity, the only possible form of time travel is to the future. Handcraft as a part of experimental archaeology is a way travelling to the past. The article discusses the concept of control theory in experimental archaeology widely applied in the Anglo-American and continental European tradition. The tradition is applied in Norway as well, especially in academic contexts. However, most experiments are geared towards action-mediated knowledge, in many cases starting as events that develop into long-term practices. The article proposes the need for a humanistic experimental archaeology expressed as action-mediated knowledge, but has no firm answer as to how to verbalize it. The empirical material is mainly the eleven archaeological open air museums and the 23 existing archaeological reconstructed ships/boats of Norway, with special emphasis on Lofotr Viking Museum as an example well known to the author.

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## Time travel to the future and the past

The special relative theory of Albert Einstein from 1905 formulates the ability to travel through time. Experiments have since repeatedly proved that time slows down in a moving clock, thus making it possible to travel into the future, at least in theory. An efficient time machine travelling into the future requires extreme speed or gravity, like the speed of light or energy like the mass of an exploded star. However, there is yet no evidence of the ability to travel back in time – into the past. The professor of Astronomy and Space Sciences Carl Sagan answered the following to the question whether he thought it ever would be possible to travel to the past:

Such questions are purely a matter of evidence, and if the evidence is inconsistent or insufficient, then we withhold judgment until there is better evidence. Right now we're in one of those classic, wonderfully evocative moments in science when we don't know, when there are those on both sides of the debate, and when what is at stake is very mystifying and very profound.

If we could travel into the past, it's mind-boggling what would be possible. For one thing, history would become an experimental science, which it certainly isn't today. The possible insights into our own past and nature and origins would be dazzling. For another, we would be facing the deep paradoxes of interfering with the scheme of causality that has led to our own time and ourselves. I have no idea whether it's possible, but it's certainly worth exploring. ([www.pbs.org/wgbh/nova/time/sagan.html](http://www.pbs.org/wgbh/nova/time/sagan.html))

Sagan's remark about history as an experimental science is intriguing, relevant to handcraft as a time machine in archaeological open air museums (AOAM) in present-day Europe. If it is possible to travel back to the past, what would then be the role of archaeology itself? Is it possible to observe without participating? Should we change events in history? And if we do, what are the aggregate effects of our action through time?

History is full of unintended evil effects of actions with good intentions, and luckily I notice that interfering with what really happened in prehistory is a non-theoretical option according to the special relativity theory. However, the 212 AOAMs of Europe (Pelillo 2009, p. 7) do exactly what is stated as a theoretical impossibility. The archaeological concept of time travel is present actions to illuminate the past. In presenting or interpreting the past we practise future knowledge in an ancient setting.

## The Anglo-American/continental European tradition of experimental archaeology

Handcraft is integrated in experimental archaeology; see different angles on this view in the discussion by Bradley, Schenck, Hein, Fasnacht and Høgseth in *Eurorea* 6/2009. On the archaeological open air museum Lofotr Viking Museum at the farm of Borg in Lofoten, Norway, we sometimes use the two terms handcraft projects and experimental archaeology as a distinction between projects demonstrating known knowledge and experiments primarily aimed at yielding new knowledge. However, the distinction is artificial because practising known knowledge is synonymous with repeating an experiment. Handcraft projects are therefore, beyond doubt in my view, a part of experimental archaeology. But

what is experimental archaeology? It might be considered as a specific branch of archaeology, as marine, medieval/urban, or waterfront archaeology etc. The archaeologies mentioned, and many more, are defined by context-specific methods common to a field of research. The border between them might be vague, but understandable due to the research history, as the Norwegian distinction between rural and urban medieval archaeology. Meldgaard and Rasmussen (1996, p. 12) defined experimental archaeology as a method for establishing analogies between the present and the past. Somewhat later Rasmussen and Grønnow elaborated the statement, telling us this is not only a method (tool), "but also as a partner in the interpretation process. During any experiment new ways of looking at the prehistoric material emerge and the researcher returns to the primary sources with new questions. This process encourages new experiments and consequently a fruitful, hermeneutic, circle is established" (Rasmussen & Grønnow 1999, pp. 138–139).

James Mathieu's definition of experimental archaeology from 2002 is often cited: "Experimental Archaeology is a sub-field of archaeological research which employs a number of different methods, techniques, analyses, and approaches within the context of a *controllable* imitative experiment to *replicate past phenomena* (from objects to systems) in order to *generate and test hypotheses* to provide or enhance *analogies* for archaeological interpretation" (Mathieu 2002, p. 1). His definition combines the idea of analogy with the meaning of the scientific experiment shared by many. The principle of analogies and the hypothetical-deductive method is important; however, the main topic, as first cited by Mathieu, is *control*. Confronted by the massive variables of experimental archaeology, where many handyman academics play skilled craftsmen of the past, one may wonder why.

These ideas of experiments are still com-

monly shared, albeit modified, in archaeology. In the chapter introducing “Experiencing Archaeology by Experiment”, a workshop held at the University of Exeter in November 2007, Cunningham, Heeb and Paardekooper summarize a consistent definition of experimental archaeology widespread in England and continental Europe at the moment:

An archaeological experiment must answer specific research question. It should have a clear statement of the aims and/or hypothesis, as well as the materials and methodology used so that it is repeatable. All variables should be discussed and as many as possible should be controlled (Outram 2008; Kucera 2004; Reynolds 1999; Träschel & Fasnacht 1996). However, one of the most important aspects of experimental archaeology is that the data derived from experiments is related back to the archaeological record (Outram 2008; Lammers-Keijsers 2005). Without this feedback process, the results will be meaningless. Basic principles like those described by Kelterborn (2005) are encouraged. (Cunningham, Heeb and Paardekooper 2008:v)

The definition might be termed the modified control theory of experimental archaeology. The difference between the earlier and the present control theory in experimental archaeology is basically the distinction between the law-like statement *is* and the normative *should*. I further denote this theory as the Anglo-American/continental European tradition of experimental archaeology. The relevance of this tradition to Scandinavian practice, more specifically Norway as an example, is to be considered below.

## Reconstructional history and present ideology

Focusing upon analogy, Jon Morton Coles demonstrate the close relationship between ethnology and experimental archaeology during the 19th century (Coles 1979). Worldwide ethnographic recording of existing communities and technical curiosity about archaeological objects of stone, bone, wood and metals led archaeologist to experiment (Coles 1979, p. 3), for instance knapping flint by applying the skills of Ishi, the last native Californian Indian discovered in 1911 (Coles 1979, p. 6). Another example is the “Viking” replica of the Gokstad ship (excavated 1888) crossing the Atlantic during 27 days of sailing to the World’s Fair in Chicago 1893 (Coles 1979, pp. 25–26). The building technique of the Viking ships was widely practised as a living tradition among boat builders along the coast of Norway at the time.

Aboriginal societies were studied unaltered by the white man until the first decades of the 20th century. The ethnographer’s changing bias from technology and material culture towards studies of social and political organization at the turn of the century made ethnography/anthropology lose relevance to experimental archaeology. The well-established field of experimental archaeology diminished before World War I (Coles 1979, p. 27). According to Coles, no major work was conducted in experimental archaeology before 1943–1958 (Coles 1979, p. 31). He cites Steensberg’s experiment on ancient sickles from 1943, Broholm’s experiment on bronze lurs from 1949, Heyerdahl’s Kon-Tiki publication from 1948 and finally Hans-Ole Hansen’s replica of houses from 1956 (Coles 1979, pp. 31–32). Coles is right, broadly speaking, in his analyses based upon publications in English at the end of the 1970s. However, he fails to mention the principle of liv-

ing history in an authentic setting as founded by Artur Hazelius at the open air museum of Skansen in Stockholm during the 1890s. The open air museums with occasional re-enactment and demonstrations of traditional handcraft were deeply rooted in Scandinavia during the early 20th century (Rentzhog 2007). However Coles analyses are unfair to Nazi Germany, saying there were no major projects of experimental archaeology established between the world wars (Schmidt 1999). The 1931 reconstruction of the Neolithic and Bronze Age lake dwellings at Unteruhldingen in Lake Constance (Pétrequin 1999, p. 217) is probably the earliest modern AOAM of Europe. Reconstructed houses, interiors and re-enactment of the Germanic farmstead of Oerlingshausen from 1936, another manifestation of German National Socialist ideology (Schmith 1999, pp. 148–149), probably was the first modern AOAM presenting the Iron Age in Europe.

The context of Scandinavian experimental archaeology is to be studied in Bodil Petersson's doctoral thesis "Images of the past" (*Föreställningar om det förflutna*) from 2003. Petersson's definition of a reconstruction, which I follow, is:

The main conceptions are *reconstruction*, *experiment* and *re-enactment*. Experimentation is an aspect of reconstruction, usually seen as connected with research. Re-enactment, on the other hand, is generally seen as connected with popularization. Reconstruction is not to be understood literally. Reconstruction is creative interpretation emanating from the values of the present day. This study starts from full-scale reconstructions such as buildings, ships/boats, crafts, markets and festival. The reconstructions can be divided into three categories: *settlement*, *transport and event*. (Petersson 2003, p. 384)

Petersson widens the scope of reconstructions in Scandinavia beyond Coles – from the 17th century until foundation of the Historical-Archaeological Experimental Centre at Lejre in 1964, the first modern AOAM in Scandinavia (Petersson 2003, pp. 39–120). The recent alteration of the centre's name (March 2009) to the "Land of Legends" (Sagnlandet Lejre) might signify an ideological change, but the director reassures us that the name is a new wrapping around the previous content ([www.historie-online.dk/nyt/sagnlandet\\_lejre.htm](http://www.historie-online.dk/nyt/sagnlandet_lejre.htm)).

In her analysis of contemporary reconstructions Petersson concludes that the concepts of experimental archaeology in Scandinavia are dominated by "scientifically minded reconstructors focus on methods, controllable and repeatable experiments and technology" (Petersson 2003, p. 391). This is synonymous with the Anglo-American/continental European tradition of experimental archaeology. Petersson encourages the oppressed humanistic reconstructors who "want to recreate action with the stress on intuition and feeling insight, in an endeavour to understand how people lived and acted in the past" (Petersson 2003, p. 391). She points to a humanistic tradition of experiments focusing on humans, action and experience (Petersson 2003, p. 237). Her bias broadens the field from technological/functional studies toward emotions and performance. Petersson proposes no firm content for a future humanistic experimental archaeology, but her discussion has some guidelines for further development: exploring history in space with emotions beyond the two-dimensional billboard, showing a possibility, not proving (*visa istället för bevisa*) and experiencing the moments of history, not the chronology (Petersson 2003, pp. 269–272).

The existing control theory of experiments is most often unattainable in humanistic sciences apart from studies of technology and function. Even Karl Popper, who described the hypothetical-deductive method

as  $P_1 \rightarrow TT \rightarrow FE \rightarrow P_2$ , pointed to human activity as a problem as well (Molander 1996, pp. 61–62).<sup>1</sup> According to the philosopher Bengt Molander, Popper put human actions in the background instead of the centre (Molander 1996, pp. 61–62). If ever widespread in Scandinavian academic archaeology, this experimental archaeology underwent further marginalization as a result of the post-processual debate during the 1980s and 1990s. Characteristic of academic experimental archaeology in Scandinavia are fragile and shifting environments due to single experimenters. During the first decade of the 21st Century experimental archaeology as a method of analogy was hardly taught at Scandinavian universities. Anders Ödmann's one-semester course in experimental archaeology in Lund is a major exception. On the other side of the Øresund, Henriette Lyngström and Marianne Rasmussen give lectures in experimental archaeology in cooperation between the University of Copenhagen and the Historical-Archaeological Experimental Centre in Lejre. Lectures in experimental archaeology had previously been given at Uppsala and Umeå. However, the general rule is experimental archaeology conducted in the shadow of the academic institutions in Scandinavia. The foundation of "Institutet för forntida teknik" in Östersund by Tomas Johansson in 1980 and courses given at Bäckedals Folkhögskola in Sveg from 1982 are institutionalized examples of this.

The complete history of experimental archaeology during the post-processual debate in Scandinavia deserves a far better analysis beyond my vague generalization above. Of many examples of experimental archaeology conducted in the shadow of academic institutions I mention only one of which I know by participation. Oldsaksamlingen, University of Oslo, excavated lithic sites, pitfalls for elk and iron extraction sites in a future dam covering 9 km<sup>2</sup> of a low mountainous valley in Dokkfloy between 1986 and 1989. The Dokka Project

opened a basic understanding of the archaeology of the taiga in eastern Norway. New and unexpected empirical material was uncovered in large quantities – all lithic periods, animal pitfalls and other hunting techniques from the Iron Age/medieval period and direct iron production from the first century BC to 1400 AD using the bog ore. Many students participated in the excavations, and without any programme or clear intention the new empirical material resulted in experiments. Conjoining lithics, to understand the reduction processes from a core, was popular in Norway at the time. Ole Olstad started to practise the conjoining procedures the opposite way, doing lithic reduction from local quartzite to understand spread patterns on sites, the tool quality of flakes etc. The excavation of pitfalls and fences between pits preserved in intermediate bogs resulted in reconstructions and experimental hunting to study the behaviour of the elk. The excavation of well-preserved late Viking Age/medieval iron extraction sites led to experiments of direct iron production in slag tapping furnaces based on local bog ore. The reconstructions shed light on interpretations and demonstrated the new gained knowledge to visitors. With a few exceptions the experiments are still unpublished. According to the procedures of Mathieu and others, our endeavours are not experimental archaeology.

## Experimental archaeology in Norway in 2008

The above approach to experimental archaeology is not unique in Norway. I will try to quantify this by the activity known to me from the year 2008.

Besides lithic experiments at the University of Oslo (Eigeland 2009; Hansen & Eigeland 2009) and commercial replicas made by Arkikon (see Eriksen & Valum 2009), ex-

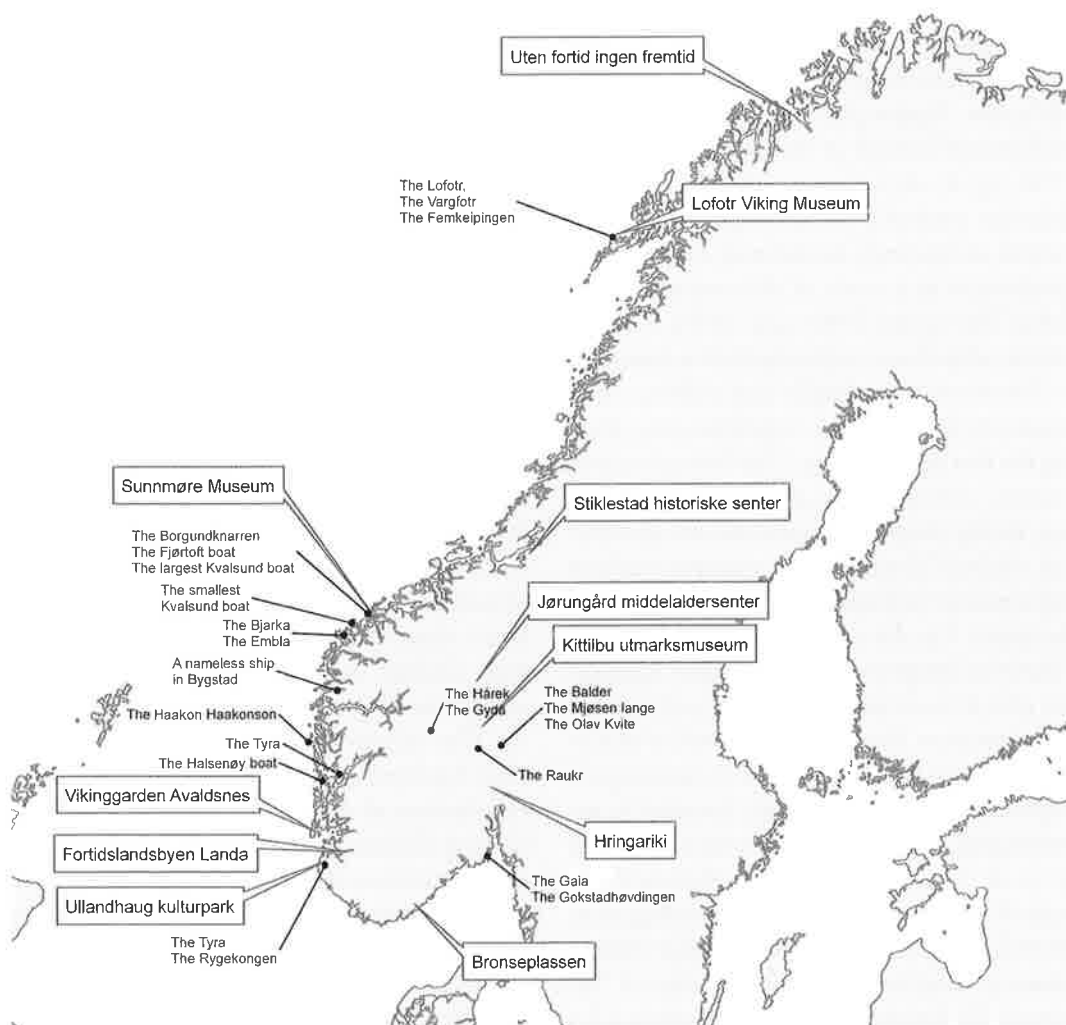


Fig. 1. Experimental archaeology in Norway – the eleven AOAMs (large text) and the 23 reconstructed ships (small text) in Norway.

periments are conducted at traditional post-Reformation open air museums and AOAMs. Handcrafts are demonstrated at the hundreds of open air museums in Norway, typically as activities on festival days and the like. I am unable to quantify the activity, but post-Reformation handcraft projects should be considered further because they often concern multi-period knowledge relevant also to archaeology. Because they are few in number, the activity

of the eleven Norwegian AOAMs is more easily surveyed: Bronseplassen, Fortidslandsbyen Landa, Ullandhaug Kulturpark, Vikinggarden Avaldsnes, Sunnmøre Museum, Hringariki, Kittilbu Utmarksmuseum, Jøringård Middelaldersenter, Stiklestad Historiske Senter, Lofotr Viking Museum and “Uten fortid ingen fremtid”.<sup>2</sup>

The definition of each institution as an AOAM might be debated, as well as the tripartition of their individual history:

1. Founded as a site of academic archaeological reconstruction (Ullandhaug Kulturpark and Fortidslandsbyen Landa)
2. Founded as an AOAM (Bronseplassen, Vikinggarden Avaldsnes, Jørundgård Middelaldersenter, Lofotr Viking Museum)
3. Archaeological expansion of an earlier post-Reformation open air museum (Sunnmøre Museum, Kittilbu Utmarksmuseum, Hringariki, Stiklestad Historiske Senter and “Uten fortid ingen fremtid”).

Jørundgård Middelaldersenter developed from a film set visualizing the novel *Kristin Lavransdatter* by Sigrid Unset. Following a development similar to that of Bronseplassen, a full scale reconstruction due to the process writing a novel about the Bronze Age, I define both institutions founded as AOAMs.

The institutions have reconstructed houses as ongoing experiments from the Stone Age (Sunnmøre Museum), the Bronze Age (Bronseplassen, Fortidslandsbyen Landa) the early Iron Age (Fortidslandsbyen Landa, Hringariki/Veien Kulturminnepark, Ullandhaug Kulturpark), the Viking Age (Vikinggarden Avaldsnes, Stiklestad Historiske Senter and Lofotr Viking Museum) and the Middle Ages (Jørundgård Middelaldersenter, Kittilbu Utmarksmuseum and “Uten fortid ingen fremtid”). The only AOAM showing reconstructions of traditional Sámi houses (late medieval) is the project “Uten fortid ingen fremtid” in Kvænangen, a part of Nord-Troms Museum.

Considering the relatively low number of AOAMs in Norway, the themes are evenly spread chronologically. However besides settlement activities at Sunnmøre Museum and the events at the Stone Age-inspired reconstructions of “Tyvsjyen” at Saltstraumen, not defined as an AOAM here, there is low activity concerning the Stone Age in Norway.

Reconstructions of chieftain's halls are dominant (for a discussion of the hall, see Løken 2001). The first reconstructed hall in

Norway was the later phase of the excavated hall at Borg (700–950 AD). The concept developed at Lofotr Viking Museum in 1994/95 was later copied by Landa, Avaldsnes, Stiklestad, and Veien (in chronological order), but further developed according to each site's unique context and historical setting. The halls from Landa and Veien are reconstructions from the early Iron Age. At Sandnes, outside Sandnessjøen, a hall from the Viking Age is under construction.<sup>3</sup> A Viking hall was finished at Øyna Parken AS at Sakshaug on Inderøy in North-Trøndelag in autumn 2008.<sup>4</sup> Midgaard Historiske Senter, Borre in Vestfold, has plans to erect a hall from the Viking Age (pers. com. Terje Gansum). The Viking halls of Avaldsnes, Stiklestad, Sakshaug, Sandnes and the hall as planned at Midgaard are reconstructions according to general principles, not a specific building.

The overt representation of the reconstructed halls is to be understood in terms of the reconstructions as a tourist attraction and using the building in arrangements and events serving food, a commercial concept first developed by Lofotr Viking Museum. The success and economic viability of our museum has been, and still is, an inspiration to others. For a critique of the commercial concept at Borg in the early days, see Glørstad 1995. The 83 metre long and 9.5 wide three-aisled hall is reconstructed 50 metres west of the excavated house plan at Borg. The excavated house (1985–1989) is marked by posts, beams as room partitions and a surrounding earth wall with door openings to visualize the original turf wall. The reconstructed house has posts, walls, entrances and fireplaces according to excavation plans. However, adjustments have been made to modern standards, making the reconstruction function as a reconstructed exhibition where we perform handcraft (the settlement part), hold events (the hall part) and have a museum containing the excavated archaeological material (the barn/byre part). A

further analysis of the reconstruction process, the underlying ideas and how they developed, as well as the fifteen years of experience of maintenance, changes and uses of the house would be worth a seminar and publication of its own. However, the ideas behind the reconstruction have been published by the architect (Jakhelln 1994, 2003). Gisle Jakhelln first proposed reconstructing the building as a “low building with a wall height of 1.5 m and a roof covered with sods, at a pitch of 33.6° (*triungsrøst*) – as common in the area” (Jakhelln 2003, p. 303). The building would then have had a impressive total height of 4.7 m. However, a Nordic workshop at Lofotr Viking Museum in October 1993 called for a reconstruction of more status. The eventual choice was a reconstruction inspired by the stave churches, a wall height of 2.1 m from Urnes stave church and the lowest possible pitch of 45° of wooden shingles on the roof, giving a total height of 8.1 m (Jakhelln 2003, pp. 303–304). The architect put it diplomatically, saying that both the high and the low solution were likely according to the archaeological evidence. However, the high solution is unlikely because a shingle roof and turf wall is a not documented combination elsewhere. The turf wall was probably combined with a turf roof of a maximum pitch of 33.6°.

In Bodil Petersson’s eight levels of interpretations of reconstructions – sign, marking, contours, building, building with museum, furnished building, furnished and actively exposed building, settled building and historical theatre (Petersson 2003, pp. 352–359) – the reconstructed hall at Borg is mentioned as an example of a building with a museum (Petersson 2003, p. 354). Her observation of half the house is correct. The second half is a furnished building/furnished and actively exposed building at the moment. However, the hall is constantly changing, and in 2009 we plan to move the exhibition to an underground building near the entrance. The hall

at Borg seems to be a slowly changing process from Petersson’s classification towards a historical theatre with authentically dressed guides doing first-person interpretation in a fully furnished building.

Strict archaeological reconstructions of three isled houses are only to be found at Ullandhaug and among some of the houses at Landa. According to Terje Gansum (pers. com.), who did a living experiment at Ullandhaug, the houses are not suitable for living in because of smoke problems. The other houses reconstructed in Norway have other approaches, but their theory and practice are yet not studied or published. Houses speaking for themselves are problematic. The hall at Borg has a great potential for further studies to be conducted in enhanced future reconstructions.



Fig. 2. The hall of Borg (over) and the hall at Trelleborg (under). Photos Lars Erik Narmo



The halls of Scandinavia are all related (Petersson 2003). The well decorated and painted hall at Stiklestad under construction and the planned two-floor hall of Miklagaard are different reactions to the hall at Borg (Eskil Ervik and Terje Gansum, pers. com.). However, even if never mentioned as an inspiration, the appearance of the hall at Borg has many resemblance to the Trelleborg house from Zealand, Denmark, reconstructed in 1942. If the Danish outer posts are replaced with the north Norwegian turf wall, the two houses are quite identical (the internal construction is different). If true, the hall at Borg is in dialogue with the reconstruction process in 1942 and critical debates until the 1980s (Petersson 2003, pp. 98–100).

Archaeological reconstruction of boats and ships and their sailing is a strong tradition in Norway (Petersson 2003, pp. 117–121). Besides wood cutting in making a new reconstruction of the Oseberg ship (the building process starts in 2009), I am not acquainted with any archaeological boat-building activity in 2008. The reconstruction of the AD 200 Halsenøy boat by Knut Sønnes in Hardanger, finished in 2007, is the last project boat-building project to my knowledge. The maritime experimentation of Norway consists of rowing and sailing the 23 existing archaeological reconstructions of boats and ships, mainly reconstructions of the Gokstad ships, the Fjørtoft boat, the Kvalsund ships and the Halsenøy boat. In brief the affiliations of the reconstructions are (see fig.1): the *Lofotr*, the *Vargfotr*, the *Femkeipingen* (Lofoten), the *Borgundknarren*, the Fjørtoft boat, the largest Kvalsund boat (Ålesund), the smallest Kvalsund boat (Herøy), the *Bjarka*, the *Embla* (Bjørkedalen), a nameless ship (Bygstad in Sunnfjord), the *Haakon Haakonson* (Bergen), the *Tyra*, the Halsenøy boat (Hardanger) the *Balder*, the *Mjøsen Lange* and *Olav Kvite* (Lake Mjøsa), the *Raukr* (Lake Randsfjorden), the *Hårek* and the *Gyda* (Lake Strandefjorden)

the *Tyra*, the *Rygekongen* (Stavanger), the *Gaia* and the *Gokstadbøvdingen* (Sandefjord). *Odins Ravn* at Aker Brygge in Oslo is not counted among the 23 reconstructions as this Viking ship is rebuilt over the hull of an old ferry.

Like the houses, the reconstructed boats/ships along the coast of Norway speak for themselves at the moment. You have to visit the reconstructions and meet the people behind to experience the maintenance and use of the boats. The *Lofotr*, the *Vargfotr* and the *Femkeipingen* belonging to Lofotr Viking Museum are no exception. Each ship/boat has a unique history. Mentioning the *Lofotr* only, there is no other full-scale copy of the Gokstad ship without a motor. The ship was built under the auspices of Sigurd and Jakob Bjørkedal at Borg during winter 1991 and spring 92. It was sailed intensively until it sank in August 1994. The sinking is still debated, but the ultimate cause was broken keel nails making the ship sink in approximately 15 minutes. The ship was raised and repaired and sailed again the year after. Since the accident the ship has mainly been used for rowing tourists in the sheltered waters at “Innerpollen”, with occasional sailing in open waters, participating in regattas, films etc. One reason for the lower activity is the cost of bringing the 23-metre-long vessel through three shallow currents and other obstacles between the sheltered harbour of the chiefdom centre and the open sea due to a land rise of approximately one metre since the Viking Age.

The *Lofotr* accumulates experiences about the maintenance and sailing of the Gokstad ship from AD 900. The *Lofotr* was reconstructed based on available drawings of the Gokstad ship at the time. Low flexibility of the ribs, damaging the hull planks, made the local boat builder Frik Harald Bjerkeki downscale the ribs. A later three-dimensional scan of the original Gokstad ship at the Viking Ship Museum in Oslo revealed the original drawings to be oversized, as the experience of the



Fig. 3. Sailing the Lofotr. Photo Jette Mygind.

*Lofotr* already showed (Bjerkeli, pers. com.). Over the years Terje Bøe, the present captain of the *Lofotr*, has gained experience sailing the ship using the *beitiås*, a effective technique for steady sailing in strong winds and crossing up against the wind using a square sail (pers. com. Terje Bøe). The *beitiås* is documented in the Gokstad ship. The knowledge of this sailing technique might be as important as the development of the keel itself to long-distance trans-ocean sailing.

Apart from the sewn Halsenøy boat, I would say that no authentic replica of any archaeological boat/ship has ever existed in Norway. My argument is the use of modern iron as nails and rivets in the reconstructions. The original clinker-built boats used nails and rivets of iron from bog ore. In general this iron is soft, carbonless and homologous because of slag inclusion and the reforging process of the bloom. Lofotr Viking Museum is involved in projects of direct iron production. A future project is to study the effect of bog ore iron nails on the keel board of the *Lofotr*. The sinking of the ship in 1994 might have been caused by modern hard nails breaking when exposed to the flexible hull of the *Lofotr*. A soft carbonless iron is probably better adapted to mechanical aspects and corrosion problems. The idea has been under low-budget development for some years and we are still working on it.



Fig. 4. Experimental processing of seal and whale blubber in a reconstructed but downzied flag lined pit ("hellegrop") at "Gamman" in Kvænangen, Nord-Troms. Flag lined pits ("hellegrop") were used to produce oil approximately 200 – 1200 AD, probably by Sami people. The experiments in 2008 succeeded making the seal oil. We failed to make whale oil. However we managed to do so in a repeated, but slightly altered experiment at Lofotr 2009. The experiment was conducted by Gørrill Nilsen, University of Tromsø (right) Camilla Celine Nordby, Tromsø Museum (left) and me from Lofotr Viking Museum. Photo Lars Erik Narmo.

The few cited experiences of the *Lofotr* are not unique, similar experiences are probably gained on every one of the 23 replicas sailed or rowed along the coast of Norway each year.

Besides experiments with standing houses and the use of existing ships, experimental activities at the Norwegian AOAMs were low in 2008. This is even more true if general historical workshops for children are separated from experimental archaeology as such. Demonstrations to children or children participating might very well fit a definition of experimental archaeology. However, cutting wood with an iron axe or shooting at targets with bow and arrow are activities, not experiments. I have no interest in judging a self-considered experiment otherwise. A key issue dividing activities from experiments is the connection to an archaeological problem. If this is non-existent it is definitely an activity. The historical work-

shops are important aspects of the AOAMs, but not a topic for further discussion here.

According to the empirical data from 2008, Lofotr Viking Museum probably had a leading role in experimental archaeology in Norway. We conducted experiments to produce seal and whale oil in a reconstructed flag-lined pit from the Iron Age, burning charcoal in a reconstructed charcoal pit from the late Iron Age/Middle Ages, iron production from bog ore in reconstructed late Iron Age and medieval slag-tapping furnaces, forging/refinement of bloomery iron, wood carving as reconstruction of the steering ore handle from the early 10th century Gokstad ship, reconstruction of the complete late Viking Age Skjoldhamn costume found in a bog on Andøya, malting of local barley and further beer brewing using juniper water and heated stones in wooden vessels. The technique probably is synonymous with Old Norse *heita*, meaning “to heat”, a method widely in use before introduction of late medieval boiling in metal pans. We also conducted various other projects such as shoe making, tanning, painting on linen etc. The activity was mostly done at Lofotr Viking Museum, but to some extent we participated in experiments conducted in other places. Co-operative projects as a joint venture between different institutions or external skills from various European countries are a tradition at Lofotr, also in 2008.

The efforts at handcrafts such as textile reconstructions performed by re-enactors every year are considerable. I have no information to quantify this activity, but one example is approximately 30 persons attached to “Lofoten vikinglag”, an association representing the region to which Lofotr Viking Museum belongs. In 2008 they were heavily involved in authentic costume reproduction and reconstructions of portable Viking equipment suitable for participation in markets.

## Experimental archaeology as action-mediated knowledge

Reconstructions of settlement, transport and events represent substantial efforts in Norway. However, next to no activity is to be considered as experimental archaeology according to the control theory cited earlier (Cunningham, Heeb & Paardekooper 2008:v). Among other criteria missing, hardly any data derived from experiments is related back to the archaeological record, constituting the results as meaningless in the words of Cunningham, Heeb & Paardekooper.

Experiments have experiential phases. However, defining everything outside control or publication as experiential archaeology, as something other than experimental archaeology, is a problematic view (see also Schenck 2009). The distinction appears hard to practise. At the workshop “Experimental archaeology – between enlightenment and experience”, arranged in Lofoten in October 2008, Kjel Knutsson pointed to more than a decade’s time lag between the experiment and publication as a general rule in lithic projects (Narmo & Petersson (eds.) in prep). It is meaningless to consider the lithic project as experiential in the interim. Publishing an effort is no guarantee in archaeology in general. If, for various reasons, a publication fails to emerge in the end, this of course has no effect whatsoever on the experiment conducted in the past. Few publications are likely to result from the AOAMs, however, because, unlike the university departments and museums, they are not academic institutions and do not receive any financial grants for publishing. Scientific funding is non-existent except if the AOAMs are objects of external research. Reconstruction is decision-making between perspectives (Farstadvoll 2008) and publications document authenticity (Holtorf & Schadla-Hall 1999). I encourage more publishing from the 212



Fig. 5. Experimental smelting of bog ore in a 700 AD reconstructed slag tapping shaft furnace at Lofotr Viking Museum. The author to the right and his son to the left – action mediated knowledge. Photo Lofotr Viking Museum.

AOAMs in Europe. However, lack of documentation has no effect on the reconstruction conducted as an experiment as such.

Limited publications are interlinked with Norway belonging to a different tradition of experimental archaeology compared to the Anglo-American/continental European tradition. Experimental projects in Norway are primarily aimed at action-mediated knowledge (“*handlingsboren kunnskap*”, see Godal 2006, pp. 84–89). The English translation of the Norwegian term is usually “tacit knowledge”. However according to Godal “tacit knowledge” is a term invented by outsiders, denoting knowledge of which they have no words. Even if denoted as tacit, verbalization is important in acculturation of action-mediated knowledge. “Action-mediated knowledge”

is synonymous with “transmission of knowledge through action”; see a concise discussion of the term in English in *Eurorea* 6/2009 (Høgseth 2009). A typical feature of action-mediated knowledge is mediation thorough tradition. Traditions mediated through experimental archaeology differ slightly because they involve old traditions making new ones. However, the outcome is knowledge to be conveyed to colleagues, followers or students etc. by participation. Repetition is the skill or the ability to conduct a craft. You sail a Viking ship up against the wind using a square sail, or you can’t etc. The skills are the primary result; publishing is subordinate. The differences between Anglo-American/continental European and Norwegian experimental archaeology might simply be explained as the difference

between practice (*kunnen* in Norwegian or *können* in German) and theory (*viten* in Norwegian, *Wissen* in German) (Godal 2006, p. 87; Høgseth 2007, p. 400).

Action-mediated knowledge has to a great length been analysed by the philosopher Bengt Molander (1996). Citing many of the same philosophers, Høgseth recently discussed these ideas in an archaeological handcraft context (Høgseth 2007). Høgseth, a former carpenter and director of Lofotr Viking Museum, is well aquatinted with the principle and importance of action-mediated knowledge. In his doctoral thesis he verbalizes the movement of craftsmen's gestures in his analyses of tool marks on wooden structures from late Viking Age/medieval contexts. However, he conducts the experiments according to the Anglo-American/continental European methodology cited above (see e.g. Høgseth 2007, p. 219). The verbalization and choice of methodology are understandable for achieving academic credits. However, practising the craft is more relevant to verbally mediating the skills and insight documented by the thesis.

Experimental archaeologists cannot know for sure in advance if their experiment is a single event or if it is going to be a long-term practice. Long-term experiments are likely to start as an event. My experience with experimental archaeology is synonymous with action-mediated knowledge as a never-ending story of knowledge development, very like Cordula Hansen's description of the Umha Aois project in Ireland. The bronze-casting experiment lasted for twelve years and still continues. Her conclusion is that in experiments as long-term practice in a group, "social interaction facilitates ongoing experience, reflection and critique" (Hansen 2008, p. 70). I have participated in a parallel long-term project making iron out of bog ore in Dokkfløy. It started as an event in 1987 (Jacobsen, Larsen & Narmo 1988) and the project still

continues. A publication is a likely conclusion to this low-budget or non-budget project sometime in the future, but it does not exist at the moment. Cordula Hansen denotes the action-mediated knowledge through long practice experiments by the term *habitus* as defined by Bourdieu (Hansen 2008, pp. 71–72). *Habitus* denotes practice and practices as a part of everyday life. Long term experimental archaeology is likely to open access to all the activities as a combination into a greater picture. Such a holistic approach deals with difficulties while self-awareness contributes complete access to practical knowledge (Hansen 2008, p. 72). Following the theoretical arguments of Bourdieu, the problem of practice or practices arises when they are used in an academic research context. The researcher will constantly be reminded of theoretical knowledge as a final aim and denied full access to the practical knowledge studied. The perspective also biases observations and the data collected (Hansen 2008, p. 72).

## Final remarks on future time travel

Experimental archaeology in Norway is mainly directed towards action-mediated knowledge as long-term practices. It concerns settlement, transportation and events. Publishing the reconstructions is verbalization of authenticity. I have no firm prescription for how to do this, but some proposals.

Further cooperation between archaeologists and craftsmen is essential. Few archaeologists are engaged in experimental archaeology as a part of their education, and even fewer are working at the existing AOAMs in Norway. More archaeologists taking part in experimental archaeology would be positive for a variety of reasons. The need for relevant archaeological input is critical to future exper-

iments/reconstructions on all levels. Archaeologists do not always have the answers, but their expertise is at least an insurance against exploring problems of no historical relevance in general. The reconstruction or the experiment is the ultimate interpretation of archaeological material. Every archaeologist working with empirical studies or theorizing ideas about archaeological interpretation should at least have some interest in full-scale three-dimensional interpretations and how they interact with the public.

Full-scale reconstructions have been an increasing phenomenon since the 1980s, and they obviously will employ more archaeologists in the future. If archaeologists start working with practices they should consider their choice of methodology very carefully. If they perform isolated technical experiments, the Anglo-American/continental European control methodology is probably appropriate. In existing experiments with action-mediated knowledge the method is definitely going to be a mental crash for the practitioners. The anthropological method of observation through participation is probably adaptable for verbalizing the experiences of the archaeological experiment as an academic science. Another solution would be to give academic credit for practising action-mediated knowledge. However this is not an option in archaeology in Norway – yet.

At Lofotr Viking Museum in 2008 we had three full-time archaeologists and one historian working part-time among the total of 10–11 all-year permanent staff. Even if separated by a rugged coastal line of hundreds of kilometres, the museum developed projects with researchers working at university institutions. We also have increasing appointments with students of archaeology using our empirical material in their theses. A short history of Lofotr Viking Museum is available in English through *Eurorea* 5/2008 (Sæther 2008). The reconstructed hall (Jakhelln 1994,

2003), the boat shed (Jakhelln 1995) and the smithy (Høgseth 1999) at Lofotr have been published. The building of our three ships has not been published, nor has the experience of both buildings and ships during 15 years of maintenance and use. According to the research strategy of Lofotr Viking Museum we intend further publication of the reconstructions, but this challenging task lacks external funding.

As a part of the research strategy from 2007 we have developed our website as a handcrafter's voice, documenting every new project with a report. Our handcrafters vary from specialists demonstrating a craft to academic archaeologists on various levels conducting experimental archaeology. Even if this is not cited, each project conducted has been guided by the archaeologist/research manager, especially to ground projects in relevant archaeological material and problems. The projects are directed towards the needs of the museum, either as a visual handcraft activity for the visitors or to meet the need for some new object or process in our museum. It is a full-time job for a research manager to get the projects running: planning the season, choosing the archaeological problems, hiring suitable handcrafters, providing the handcrafter with necessary equipment and raw materials, discussing archaeological problems through the individual projects, supervising report writing, and publishing reports of varying literary quality without changing the intention.

Verbalizing action-mediated knowledge is a challenging and time-consuming task. According to personal responses from our seven partners in the LiveARCH network, the effort at Lofotr is probably unique to the AOAMs in Europe. An evaluation should be about general principles, but my wonder is: Who reads the Internet articles anyway? Are other ways to document action-mediated knowledge more relevant to the context – for instance visual anthropology? Or should we just for-

get about it and re-implement the theoretical consequences of action-mediated knowledge as a non-academic practice? The last option leaves experimental archaeology fully in the field of the Anglo-American/continental European control methodology geared towards academic credit.

## Notes

- 1 “Utgångspunkten är ett problem (P<sub>1</sub>). För att lösa det uppställs en tentativ (provisorisk) teori (TT), vars fel man försöker eliminera (FE), vilket leder till ett nytt problem (P<sub>2</sub>)” (Molander 1996, p. 61).

- 2 “**Uten fortid ingen fremtid**”, “**Gamman**”:

1. Production of seal and whale oil in a reconstructed Iron Age flag-lined pit (*hellegrop*). Conducted by Tromsø Museum, Arkeologisk institutt ved universitetet i Tromsø and Lofotr Viking Museum.

### Lofotr Viking Museum:

1. Charcoal in a reconstructed Iron Age/medieval charcoal pit (*kullgrop*). In cooperation with Kittilbu Utmarksmuseum and the Montale Terramara Park as a part of Modena's Civic Museum of Archaeology and Ethnology.

2. Iron production based on bog ore in a reconstructed Merovingian furnace excavated in Trøndelag. In cooperation with Kittilbu Utmarksmuseum, Montale Terramara Park de Modena and the smith Jostein Espelund from Heidalen.

3. Refining bog ore blooms into iron. Hired smith Götz Breitenbücher from Sweden.

4. Reconstruction of the steering oar from Gokstad. Hired woodcarver Doreen Werhold from Germany in cooperation with the Viking Ship Museum in Oslo (Vikingskipshuset).

5. Reconstruction of the Iron Age/medieval costume from Skjoldehamn (*Skjoldehamnndrakten*). Hired textile worker Inger Lepsø, Tone Johansen and Karin Sliper in cooperation with the Department of Archaeology, University of Bergen.

6. Beer brewing based on locally produced barley, experimenting with the Iron Age technique called *heita* in Old Norwegian. In cooperation with local farmers and Lofotr Vikinglag.

7. Experimental smithing demonstrating ordinary and special techniques used to produce the iron objects excavated in the house Borg I. Hired smith Robin Evavoll. [www.lofotr.no/Rapporter\\_645.html](http://www.lofotr.no/Rapporter_645.html)

### Stiklestad Historiske Senter:

1. Reconstruction of a long-house, a hall from the Viking Age. In the subterranean concrete basement of the hall there are modern facilities. The above-ground reconstruction of the hall is built in woodwork by hired carpenters and woodcarvers. The hall is going to be richly carved and painted inside. The project is one of many ongoing interpretations of how the Viking halls of Scandinavia might have appeared. [www.stiklestad.no/opplevelser/stiklastadir/artikler.html](http://www.stiklestad.no/opplevelser/stiklastadir/artikler.html)

### Jørundgard Middelaldersenter:

No experimental archaeology is known. <http://bart.idium.no/uleno202.tmp/d4Wzn2lrYY9.5.idium?RND=0.9116027107723118>

### Kittilbu Utmarksmuseum:

1. Iron production of blooms from bog ore in a reconstructed medieval furnace excavated in Dokkfløy, in cooperation with Lofotr Viking Museum.

2. Reconstruction a pair of medieval furnaces from Dokkfløy experimenting using local clay. In cooperation with Lofotr Vi-

king Museum.

3. Charcoal in a reconstructed Iron Age/medieval charcoal pit (*kullgrop*). In cooperation with Lofotr Viking Museum.  
[www.randsfjordmuseene.no/](http://www.randsfjordmuseene.no/)

#### **Hringariki, Veien Kulturpark:**

The reconstructed long-house from the Early Roman Iron Age opened in 2005. Handcraft projects are mentioned in the programme for 2009, but the activity/specific projects were not known to me in 2008.

[www.hringariki.no/index.html](http://www.hringariki.no/index.html)

#### **Sunnmøre Museum:**

Sunnmøre Museum was an ordinary open air museum, but they have developed their activity also to be counted among the AOAMs of Norway. Besides their three archaeological reconstructed ships (mentioned below) and one reconstructed Jekt, they have reconstructed a Stone Age dwelling with two huts where they do flint knapping and other activities for children and schools.

[www.sunnmoremuseum.no/](http://www.sunnmoremuseum.no/)

#### **Vikinggarden Avaldsnes:**

Six reconstructed buildings, a reconstructed smaller boat from Gokstad and chariots are part of a continuous experimental project. A tar kiln is fired regularly for maintenance of the buildings. I have no information as to whether the tar kiln was in use in 2008.

1. A shipbuilding project, the ship type is a secret at the moment, was under planning (pers. com. Marit Synnøve Veå). However, no specific experimental work conducted on the site in 2008 is known to me.

<http://no.vikingkings.com/PortalDefault.aspx?portalID=115&activeTabID=759&parentActiveTabID=750>

#### **Ullandhaug Kulturpark:**

Ullandhaug is a reconstructed early Iron Age farm with three houses based upon excavated buildings on the site. The building of the farm in the 1970s was experimental and the farm has later been an arena for various experiments. Earlier literature on experiments is cited on the website. Besides this Terje Gansum has conducted unpublished experimental cremations of pigs, charcoal burning in a charcoal pit and living experiments in the reconstructed houses (pers. com. Terje Gansum). No experimental archaeology is known at Ullandhaug from 2008.

[www.jernaldergarden.no/jernaldergarden.htm](http://www.jernaldergarden.no/jernaldergarden.htm)

#### **Fortidslandsbyen Landa:**

More than 250 houses were excavated on Landa in Forsand. Four houses belonging to the Bronze Age and the Iron Age have been reconstructed. Apart from the earlier construction of the houses there is no known experimental archaeology at Landa.

[www.forsand.kommune.no/artikkel.aspx?AId=217&Back=1](http://www.forsand.kommune.no/artikkel.aspx?AId=217&Back=1)

#### **Bronseplassen:**

Research for writing a novel about the Bronze Age led to the establishment of a Bronze Age farm with a reconstructed long-house. The centre has earlier reconstructions of dugout boats, labyrinths and an offering bog. The Viking camp with a big tent is a later expansion of the centre.

1. A smithy (*grindhus-smie*) is mentioned on the website as having been reconstructed in 2008. Besides pictures of the foundation works, no picture of the finished smithy is yet available through the website.

2. Reconstructions of longbows, arranged as a course.



www.bronseplassen.no/

- 3 No website is available, but see the newspaper article [www.helgeland-arbeiderblad.no/kultur/article3996469.ece](http://www.helgeland-arbeiderblad.no/kultur/article3996469.ece).
- 4 Øynaparken see [www.oynaparken.no/public.aspx?pageid=39589](http://www.oynaparken.no/public.aspx?pageid=39589).

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